

Exhibit 1

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REQUEST FOR EX PARTE REEXAMINATION TRANSMITTAL FORM

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P.O. Box 1450
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Attorney Docket No.: 024115

Date: February 12, 2021

1. ☒ This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number 10,534,382 issued January 14, 2020. The request is made by:
- ☐ patent owner. ☒ third party requester.

2. ☒ The name and address of the person requesting reexamination is:
- David P. Emery
Sughrue Mion PLLC
2000 Pennsylvania Ave. NW, Washington, DC 20006

3. Requester ☐ asserts small entity status (37 CFR 1.27) or ☐ certifies micro entity status (37 CFR 1.29). Only a patent owner requester can certify micro entity status. Form PTO/SB/15A or B must be attached to certify micro entity status.

4. This request is accompanied by payment of the reexamination fee as set forth in:

- ☒ 37 CFR 1.20(c)(2); or
- ☐ 37 CFR 1.20(c)(1). In checking this box for payment of the fee set forth in 37 CFR 1.20(c)(1), requester asserts that this request has forty (40) or fewer pages and complies with all other requirements of 37 CFR 1.20(c)(1).

Payment of the reexamination fee is made by the method set forth below

- a. ☐ A check in the amount of \$_____ is enclosed to cover the reexamination fee;
- b. ☐ The Director is hereby authorized to charge the reexamination fee to Deposit Account No. _____;
- c. ☐ Payment by credit card. Form PTO-2038 is attached; or
- d. ☒ Payment made via EFS-Web.

- ☐ In addition, the Director is hereby authorized to charge any fee deficiencies to Deposit Account No. _____.

5. ☒ Any refund should be made by ☐ check or ☒ credit to Deposit Account No. 19-4880 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.

6. ☒ A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4).

7. ☐ CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
- ☐ Landscape Table on CD

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This collection of information is required by 37 CFR 1.510. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) a request for reexamination. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Ex Parte Reexam, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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8. ☐ Nucleotide and/or Amino Acid Sequence Submission
If applicable, items a - c. are required.
- a. ☐ Computer Readable Form (CRF)
- b. Specification Sequence Listing on:
- i. ☐ CD-ROM (2 copies) or CD-R (2 copies) or
- ii. ☐ paper
- c. ☐ Statements verifying identity of above copies.
9. ☒ A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.
10. ☒ Reexamination of claim(s) 1-20 is requested.
11. ☒ A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO/SB/58, PTO-1449, or equivalent.
12. ☐ An English language translation of all necessary and pertinent non-English language patents and/or printed publications is attached.
13. ☒ The attached detailed request includes at least the following items:
- a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1).
- b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2).
14. ☐ A proposed amendment is included (only where the patent owner is the requester). 37 CFR 1.510(e).
15. ☒ It is certified that the statutory estoppel provisions of 35 U.S.C. 315(e)(1) or 35 U.S.C. 325(e)(1) do not prohibit requester from filing this *ex parte* reexamination request. 37 CFR 1.510(b)(6).
16. Service
- a. ☒ It is certified that a copy of this request (if filed by other than the patent owner) has been served in its entirety on the patent owner as provided in 37 CFR 1.33(c).
- The name and address of the party served are:
- Ecofactor, Inc
- Knobbe Martens Olson & Bear LLP
- 2040 Main Street, 14th Floor, Irvine, CA 92614
- Date of Service February 12, 2021
- OR
- b. ☐ A duplicate copy is enclosed since service on patent owner was not possible. An explanation of the efforts made to serve patent owner is attached. See MPEP 2220

17. Correspondence Address: Direct all communication about the reexamination to:

☒ The address associated with Customer Number: 23373

OR

☐ Firm or Individual Name _____
(at the address identified below)

Address

City

State

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18. ☐ The patent is currently the subject of the following concurrent proceeding(s):

- a. ☐ Copending reissue Application No. _____
- b. ☒ Copending reexamination Control No. IPR2021-0054
- c. ☐ Copending Interference No. _____
- d. ☒ Copending litigation styled:

EcoFactor, Inc. v. Alarm.com Inc., 1:20-cv-11007-LTS (D. Mass.); EcoFactor, Inc. v. Google LLC, Case No. 6:20-cv-00075-ADA (W.D. Tex.)

EcoFactor, Inc. v. Ecobee, Inc., Case No. 6:20-cv-00078-ADA (W.D. Tex.); EcoFactor, Inc. v. Vivint, Inc., Case No. 6:20-cv-00080-ADA (W.D. Tex.)

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/David P. Emery/

Authorized Signature

February 12, 2021

Date

David P. Emery

Typed/Printed Name

55,154

Registration No.

☐ For Patent Owner Requester

☒ For Third Party Requester

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: John Douglas Steinberg)
)
Patent No: 10,534,382)
)
Date of Patent: January 14, 2020)
)
Title: SYSTEM AND METHOD)
FOR USING A WIRELESS)
DEVICE AS A SENSOR FOR)
AN ENERGY)
MANAGEMENT SYSTEM)
)
Filed: April 3, 2019)
)

Mail Stop "*Ex Parte* Reexam"
Attn: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR REEXAMINATION OF U.S. PATENT 10,534,382

Request for *Ex Parte* Reexamination
U.S. Patent No. 10,534,382

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EXHIBITS

Exhibit	Description
A	U.S. Patent No. 10,534,382 (the “’382 Patent”)
B	File History of the ’382 Patent
C	U.S. Patent Pub. No. 2009/0302994 (“Rhee”)
D	U.S. Patent No. 8,020,777 (“Kates”)
E	U.S. Patent No. 8,239,922 (“Sullivan”)
F	Western District of Texas Preliminary Claim Constructions (Dec. 9, 2020)
G	Declaration of Tajana Šimunić Rosing, Ph.D.
H	File History of U.S. Appl. No. 15/002,791
I	File History of U.S. Appl. No. 13/470,074
J	File History of U.S. Appl. No. 12/502,064
K	File History of U.S. Provisional Appl. No. 61/134,714
L	Terminal Disclaimer for the ’382 Patent

Pursuant to 35 U.S.C. §§ 302-307 and 37 C.F.R. § 1.510, Alarm.com Incorporated (“Alarm.com”) respectfully requests *ex parte* reexamination of claims 1-20 of U.S. Patent No. 10,534,382 (Exhibit A, the “’382 Patent”), which was filed on April 3, 2019, issued on January 14, 2020 to EcoFactor, Inc. (“EcoFactor” or “Patent Owner”), and is currently assigned to EcoFactor according to the United States Patent and Trademark Office (the “Office”) assignment records.

As set forth in detail below, U.S. Patent Pub. No. 2009/0302994 (“Rhee”), alone or in combination with other references, raises substantial new questions of patentability of claims 1-20 of the ’382 Patent.

I. CLAIMS FOR WHICH REEXAMINATION IS REQUESTED

Pursuant to 35 U.S.C. § 303 and 37 C.F.R. § 1.510, the following prior art references raise substantial new questions of patentability (“SNQP”) concerning claims 1-20 of the ’382 Patent:

U.S. Patent Pub. No. 2009/0302994 (“Rhee”)

U.S. Patent No. 8,020,777 (“Kates”)

U.S. Patent No. 8,239,922 (“Sullivan”)

Pursuant to 37 C.F.R. § 1.510(b)(3), copies of Rhee, Kates and Sullivan are attached hereto as Exhibits C-E, respectively.

In particular, pursuant to 37 U.S.C. § 1.510(b)(1), Alarm.com identifies the following references that raise a SNQP concerning claims 1-20 of the ’382 Patent.

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SNQP No.	Claim(s)	Basis for Rejection
1	1-20	Anticipated by Rhee and/or obvious in view of Rhee and the knowledge of a POSITA
2	7-9, 15-16	Obvious in view of Rhee, Sullivan and the knowledge of a POSITA
3	1-20	Obvious in view of Rhee, Kates and the knowledge of a POSITA
4	7-9, 15-16	Obvious in view of Rhee, Sullivan, Kates and the knowledge of a POSITA

II. REQUIRED CERTIFICATIONS

Submitted herewith is the fee set forth in 37 C.F.R. § 1.510 and 37 C.F.R. § 1.20(c)(1).

Pursuant to 37 C.F.R. § 1.510(b)(5), the attached Certificate of Service indicates that a copy of this Request has been served on Patent Owner at the following address of the attorney of record for Patent Owner, in accordance with 37 C.F.R. § 1.33(c):

EcoFactor, Inc.
Knobbe Martens Olson & Bear LLP
2040 Main Street, 14th Floor
Irvine, CA 92614

As required by 37 C.F.R. § 1.510(b)(6), Alarm.com certifies that the statutory estoppel provisions of 35 U.S.C. § 315(e)(1) and 35 U.S.C. § 325(e)(1) do not prohibit Alarm.com from filing this *ex parte* reexamination request.

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III. NOTICE OF PENDING LITIGATION

The '382 Patent is the subject of four patent infringement lawsuits by the assignee of record, EcoFactor, which may affect, or be affected by, a decision in this proceeding: *EcoFactor, Inc. v. Google LLC*, Case No. 6:20-cv-00075-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Ecobee, Inc.*, Case No. 6:20-cv-00078-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Vivint, Inc.*, Case No. 6:20-cv-00080-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Alarm.com Inc.*, 1:20-cv-11007-LTS (D. Mass., filed May 26, 2020).¹

EcoFactor has asserted four patents against Petitioner in the Massachusetts litigation: U.S. Patent Nos. 8,738,327, 8,412,488, 8,180,492 and the '382 Patent.

The '382 Patent is also the subject of a Request for *Inter Partes* Review in IPR2021-00054, which was filed by Google LLC on October 22, 2020.

¹ On December 9, 2020, the Court issued preliminary claim constructions in the Western District of Texas actions. In relevant part, the Court construed the term “measurement” in the claims of the '382 Patent to have its plain and ordinary meaning. Ex. F at 3. No other terms from the '382 Patent claims were construed by the Court.

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IV. SUMMARY OF THE '382 PATENT

A. Brief Description of the '382 Patent

The '382 Patent is directed to systems and methods for “thermostatic HVAC and other energy management controls that are connected to a computer network”.

Ex. A at 1:16-19. Specifically, the '382 Patent relates to the use of user interactions with an interface such as a personal computer as a signal related to occupancy to inform an energy management system. *Id.* at 1:16-23.

The '382 Patent states that energy consumption by an HVAC system is directly proportional to the setpoint (*i.e.*, the desired temperature set on a thermostat). *Id.* at 2:15-24. Therefore, allowing the setpoint to rise by several degrees in the summer during periods when the home is unoccupied can result in reduced energy consumption and greater cost savings. *Id.* at 2:24-34. The '382 Patent explains that it would be desirable to provide a system that could accurately detect occupancy and control the HVAC system accordingly. *Id.* at 3:15-20. For example, the '382 Patent contemplates detecting occupancy based on a user's activity patterns on certain “computers or other consumer electronic devices”. *Id.* at 3:24-41.

Claim 1 of the '382 Patent is directed to a system for controlling an HVAC system at a user's building comprising one more processors with circuitry and code designed to execute instructions that, among other things, receives data, commands

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and user-specific information, and controls an HVAC system based on a determination as to whether the building is occupied or unoccupied. *Id.* at cl. 1.

B. Summary of the Prosecution History of the '382 Patent

The '382 Patent issued from U.S. Pat. App. No. 16/374,085 (the "'085 Application"), which also claimed the benefit of U.S. Pat. App. Nos. 15/002,791 (filed Jan. 21, 2016), 13/470,074 (filed May 11, 2012), 12/502,064 (filed July 13, 2009) and 61/134,714 (filed July 14, 2008). Ex. B at B.210.

In an office action dated May 8, 2019, the Examiner rejected all pending claims under 35 U.S.C. § 103 on the basis of U.S. Patent Pub. Nos. 2008/0281472 ("Podgorny") and 2010/0308119 ("Steinberg"). *Id.* at B.167-79. In that same office action, the Examiner also rejected claims 1-19 on the ground of non-statutory double patenting over U.S. Patent Nos. 10,289,131, 9,244,470 and 8,180,492, and rejected claims 19-20 under 35 U.S.C. § 112 ¶ 2. *Id.* at B.160-67. In response, Applicants submitted a terminal disclaimer and requested that the double patenting rejection be withdrawn. *Id.* at B.126. Applicants also amended claim 19 to address the § 112 rejection, and argued that the § 103 rejection should be withdrawn because Steinberg was not prior art. *Id.* at B.127-28.

In an office action dated July 17, 2019, the Examiner again rejected all pending claims under § 103 on the basis of Podgorny and U.S. Patent Pub. No. 2005/0270151 ("Winick"). *Id.* at B.84-96. In that same office action, the

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Examiner also rejected claims 13, 16 and 20 under § 112 ¶ 2. *Id.* at B.083. In response, on April 3, 2019, Applicant amended the claims to all recite (or depend from a claim that recites) that the one or more processors include a processor “located remotely from the memory and is not electrically connected to the memory” and that the memory “is configured to store historical values of the first data and second data”. *Id.* at B.049-54. On September 4, 2019, the Examiner allowed the claims as amended, finding that those limitations were not disclosed in the prior art. *Id.* at B.013-21.

The terminal disclaimer for the '382 Patent is attached as Exhibit L.

V. CITATION OF PRIOR ART

Reexamination is requested in light of the following prior art references:

1. U.S. Patent Pub. No. 2009/0302994 (“Rhee”). The application for Rhee was filed on June 10, 2008 and it was published on December 10, 2009. Rhee was not cited as a reference in the prosecution of the '382 Patent. A copy of Rhee is attached as Exhibit C.

2. U.S. Patent No. 8,020,777 (“Kates”). The application for Kates was filed on January 29, 2007 and the patent was issued on September 20, 2011. Kates was not cited as a reference in the prosecution of the '382 Patent. A copy of Kates is attached as Exhibit D.

3. U.S. Patent No. 8,239,922 (“Sullivan”). The application for Sullivan

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was filed on August 27, 2007 and the patent was issued on August 7, 2012.

Sullivan was not cited as a reference in the prosecution of the '382 Patent, although a similar reference, U.S. Patent Pub. No. 2009/0057426, was cited. Ex. B at B.201. A copy of Sullivan is attached as Exhibit E.

The '382 Patent is subject to the prior art requirements of the Leahy-Smith America Invents Act, Pub. L. 112-29, 125 Stat. 284 (2011) ("AIA").² Each of the above references is prior art to the '382 Patent under the AIA, 35 U.S.C. §

² To be subject to the AIA, the patent must meet the requirements of Section 3(n)(1) of the AIA. The '382 Patent meets these requirements at least because claims 19 and 20 have an effective filing date after March 16, 2013. Claims 19 and 20 the '382 Patent were added by amendment in 2019 (after March 16, 2013) without any written description support in the application. Ex. B at B.054. Nor does any application to which the '382 Patent claims priority provide written description for claims 19 or 20. For example, claim 20 requires that the processors control the HVAC system based at least in part on historical values of measurements of the temperature of the building (first data) and outdoor temperatures received from the Internet (second data). Neither the application that resulted in the '382 Patent nor any of the earlier applications incorporated therein contain any teaching of this limitation. See Exs. B, H-K.

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102(a)(2) (2018), because they were filed before the earliest possible effective filing date for the claims of the '382 Patent, July 14, 2008. They would also be prior art to the '382 Patent under pre-AIA 35 U.S.C. § 102(e)(1) (2006) (for Rhee) and 35 U.S.C. § 102(e)(2) (2006) (for Kates and Sullivan).

VI. STATEMENT POINTING OUT SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY ("SNQP")

A. Summary of Proposed Rejections

Pursuant to 37 C.F.R. § 1510(b)(1), Alarm.com sets forth a statement raising an SNQP regarding all claims of the '382 Patent based on Rhee or based on Rhee in combination with Kates and/or Sullivan.

SNQP 1 sets forth a proposed rejection of claims 1-20 under 35 U.S.C. § 102 and/or 35 U.S.C. § 103 in view of Rhee.

SNQP 2 sets forth a proposed rejection of claims 7-9 and 15-16 under 35 U.S.C. § 103 in view of Rhee and Sullivan.

SNQP 3 sets forth a proposed rejection of claims 1-20 under 35 U.S.C. § 103 in view of Rhee and Kates.

SNQP 4 sets forth a proposed rejection of claims 7-9 and 15-16 under 35 U.S.C. § 103 in view of Rhee, Sullivan and Kates.

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B. SNQP 1: Claims 1-20 are anticipated by or rendered obvious by Rhee.

SNQP 1 addresses all claims in view of Rhee. Alarm.com submits that Rhee disclosed all elements of claims 1-20 to a POSITA. However, to the extent that Rhee alone is found not to anticipate any of claims 1-20, Alarm.com submits that the differences would have been obvious. Further explanation of obviousness with respect to certain claim limitations is found below and also in the Declaration of Tajana Šimunić Rosing, Ph.D, submitted as Exhibit G to this Request.

1. Overview of Rhee.

Rhee is directed to energy management systems and methods that include at least one wireless controller in communication with a management server, which manage energy devices (*e.g.*, HVAC systems) based on an energy profile. Ex. C. at Abstract, [0003].

2. Rhee disclosed all elements of independent claims 1 and 17.

(a) Rhee disclosed a management server with a memory and one or more processors.

All challenged claims require a system comprising “a memory” and “one or more processors with circuitry and code designed to execute instructions”. Rhee disclosed these limitations. Ex. G at ¶¶ 59-67.

Rhee disclosed a “management server” as a component of the HVAC control system. The management server managed energy-consuming devices (including

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HVAC systems such as air conditioners and heaters). Ex. C at [0037]-[0038]. As disclosed by Rhee, the management server was implemented as one or more computers containing one or more processors, memory for storage of instructions and data, along with circuitry. *Id.* at [0104]-[0107]. This fact would also have been obvious as computer servers containing processors and utilizing memory were well known in the art in 2008. Ex. G at ¶ 60. Rhee also disclosed “wireless controllers” that contained processors and could be included among the claimed “one or more processors” because they worked jointly with the management server to manage the system. *Id.* at [0037]; [0103]-[0107]; Ex. G at ¶ 66.

- (b) Rhee disclosed the management server received “first data from at least one sensor” that included a “measurement of the current temperature of the building”.

Claim 1 requires that the “one or more processors” “receive a first data from at least one sensor” that “includes a measurement of at least one characteristic of the building”. Claims 4 through 6 and claims 17, 18 and 20 require that the first data include “a measurement of the current temperature of the building by the sensor”. Rhee disclosed the “first data” limitations, including the more narrow requirement of claims 4-6, 17, 18 and 20 that the first data include a measurement of the current temperature of the building. Ex. G at ¶¶ 68-70, 115-117.

Rhee disclosed that the wireless controller at the building transmitted

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“energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the inside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. Figure 4 of Rhee illustrates how the inside temperature of the building (as well as other characteristics of the building) was measured using a temperature sensor and transmitted via a wireless gateway to the management server. *Id.* at [0074]-[0075]; [0079]. Rhee’s disclosures indicated that the data received by the management server included inside temperature measured by a temperature sensor in the building, as well as other characteristics of the building. Ex. G at ¶¶ 69-70.

- (c) Rhee disclosed the management server received “second data from a network connection” that comprised a “measurement of the current outdoor temperature” that was “collected from a source external to the building”.

All challenged claims require that the “one or more processors” “receive a second data from a network connection” that “is received via the Internet” and that the second data is “collected from a source external to the building”. Claim 5, which depends from claim 1, further requires that the second data “comprises a measurement of the current outdoor temperature”. Claims 17, 18 and 20 similarly require that the second data “comprises outdoor temperature”. Rhee disclosed the “second data” limitations, including the more narrow requirement of claims 5, 17, 18 and 20 that the second data comprise a measurement of the current outdoor

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temperature. Ex. G at ¶¶ 71-73, 118-120.

Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the temperature outside the building. *Id.* at [0057]; [0016]; [0040]; [0042]. The management server received this data from a connection to the Internet (which was a network). *Id.* at [0040]; [0045]. Rhee further disclosed that the outside temperature was measured by a temperature sensor “placed outside the building”. *Id.* at [0079]. The outside temperature measurements were used by the analysis module, which was part of the management server. *Id.* at [0067] (“[T]he analysis module 226 creates a [sic] energy report for the current inputted by the HVAC unit versus the average temperature outside of the building as recorded by a temperature sensor over the course of the past ten years.”). Rhee’s disclosures indicated that the data received by the management server via its Internet connection included outside temperature measurements collected by a temperature sensor outside of and hence external to the building. Ex. G at ¶¶ 72-73.

- (d) Rhee disclosed the management server received a temperature setpoint to use when a building was occupied and a second temperature setpoint to use when a building was unoccupied.

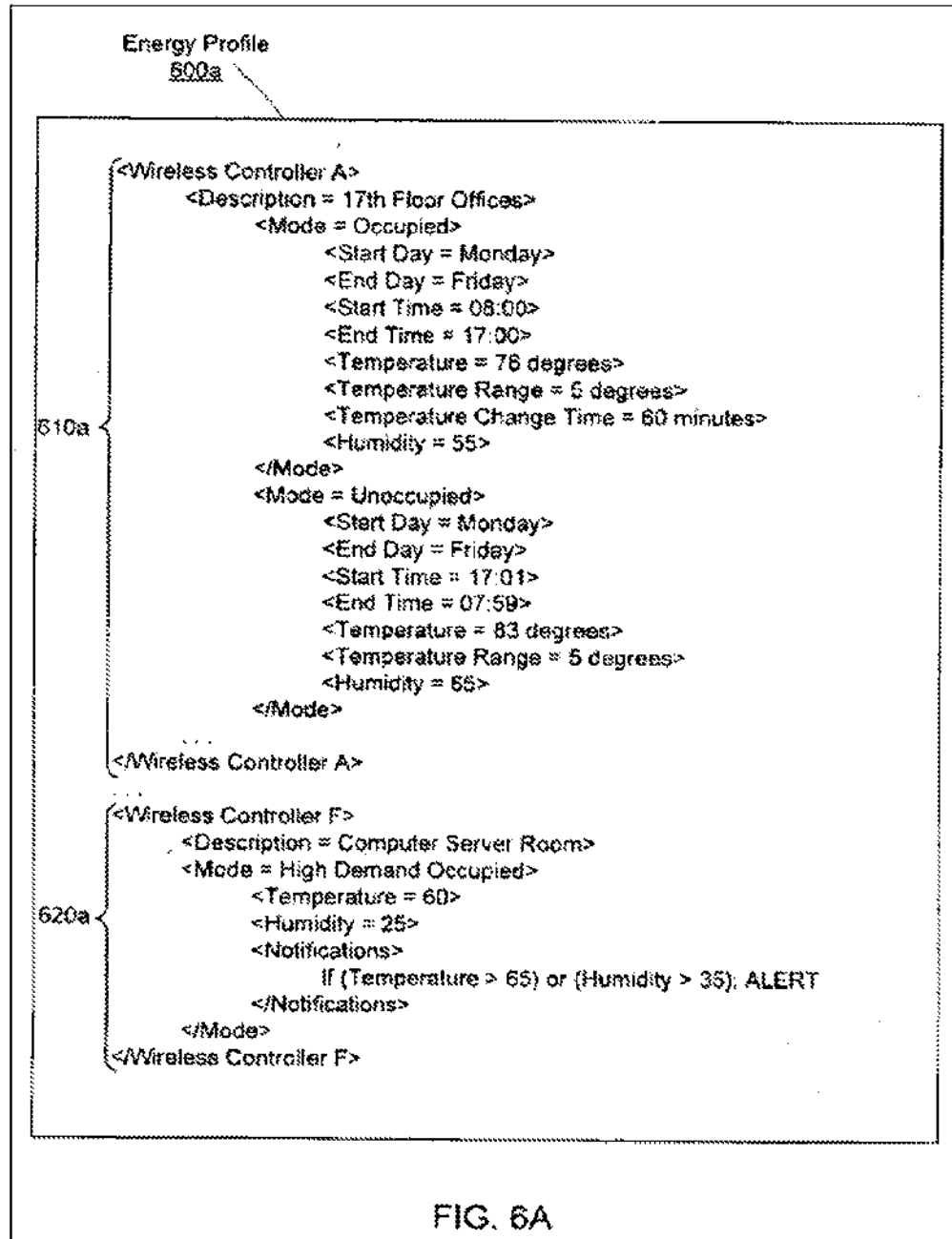
All challenged claims require the one or more processors receive a first

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temperature setpoint “corresponding to a desired temperature setting when the building is occupied” and a second temperature setpoint “corresponding to a desired temperature setting when the building is unoccupied”. Rhee disclosed these limitations. Ex. G at ¶¶ 74-77.

Rhee disclosed that the management server maintained an “energy profile” which contained, among other things, a first temperature setpoint that corresponded to a desired temperature for when the building was occupied, and a second temperature setpoint that corresponded to a desired temperature when the building was unoccupied. *See* Ex. C at [0052] & Table 2; [0056]. Figure 6A provides examples of the two temperature setpoints:

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Rhee disclosed that the temperature setpoints in the energy profile could be modified by a user using a client module. Ex. C at [0056]. The client module was a user interface to the management server and could communicate with the management server over the a network connection. *Id.* at [0045]. Therefore, a

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POSITA would appreciate that the management server *received* modifications to the desired temperature setpoints for when the building was occupied and unoccupied over a network connection from the client module. Ex. G at ¶¶ 76-77.

- (e) Rhee disclosed the management server received commands through the Internet from a remote interface on a mobile, wireless device.

All challenged claims require that the one or more processors “receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code” that “allow[s] the user to adjust temperature setpoints for the HVAC system”. Rhee discloses this limitation. Ex. G at ¶¶ 78-80.

Rhee disclosed a client module that provided a user interface to “remotely control” the management server. Ex. C at [0056]. The client module contained a transmitting device for transmitting commands to the management server via the Internet. *Id.* at [0045] & Fig. 1B; [0056]. The transmitting device of the client module was disclosed to include mobile devices such as cellular phones that communicated wirelessly. *Id.* at [0113]. A POSITA would have appreciated that the client module included mobile wireless devices such as cellular phones running software application code, such as a web browser, that sent commands to the management server to control system. Ex. G at ¶¶ 79-80. Furthermore, the client

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module allowed the user to adjust the temperature setpoints stored in the management server's energy profile. Ex C. at [0056].

- (f) Rhee disclosed the management server sent user-specific data through the Internet to a remote interface on a mobile, wireless device.

All challenged claims require that the one or more processors “send user-specific data through the Internet” that “user-specific information about the building and HVAC system is generated based at least in part on the user-specific data” and that “user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code”. Rhee discloses these limitations. Ex. G at ¶¶ 81-87.

As explained above, Rhee disclosed a client module, including a cellular phone, that communicated with the management server via the Internet. Rhee disclosed that access via the client module was controlled by a “username/password” or “other type of authentication mechanism”. Ex. C at [0056]. A POSITA would have understood such a system to provide information specific to the user who was authenticated, and only such information as that user was authorized to access. Ex. G at ¶ 83. For example, the management server could support multiple users associated with different building systems. A POSITA would have understood that a user would see data only for the particular building (or buildings) which they were allowed to access. Ex. G at ¶ 84.

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Furthermore, the client module would present information based on the user-specific data it received, for example by displaying charts or analysis reports that the user was authorized to access on a web page. *Id.* at [0056]; [0110]; [0113]. This user-specific information concerned the HVAC system and building, such as energy consumption conditions for the HVAC system, the energy profile for the user, and the network status. *Id.* at [0056]. Additionally, “depending on their access level”, the user would be presented with the option to modify the energy profile (*e.g.*, temperature setpoints). *Id.*

A POSITA would have understood from Rhee’s disclosure that the server sent user-specific data to a cellular phone so that a user could view user-specific information about the system on a remote user interface (*e.g.*, a web browser).

Ex. G at ¶ 87.

- (g) Rhee disclosed that the management server determined whether the building was occupied or unoccupied and controlled the system based on whether the building was occupied or unoccupied.

Claim 1 requires that the one or more processors “determine whether the building is occupied and unoccupied and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature”. Claim 17 requires that the one or more processors “control the HVAC system based on the determination that the building is occupied to provide

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heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied”. Rhee disclosed these limitations. Ex. G at ¶¶ 88-94, 197-201.

Rhee disclosed that the system could determine whether the building was occupied or unoccupied based on a schedule or based on occupancy sensors. Ex. C [0052]; [0097]; Table 2 & Table 8.

TABLE 8

Exemplary Operational Modes				
Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., ± 3 degrees)	Schedule, occupancy sensors or exit of Override mode
Unoccupied	Empty	Local thermostat disabled	Disabled	Schedule or occupancy sensors
Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., ± 5 degrees)	Override button
Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., ± 10 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optimal Generation Source	Energy source availability	Energy profile control	Depends on generation source	Energy source availability
Transition	HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or statistical data

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The schedule allowed a user to specify time periods when the building would be occupied and time periods when it would be unoccupied. *Id.* at [0088] & Fig. 6A.

TABLE 2

<u>Exemplary Office HVAC Energy Profile.</u>					
Mode	Start Time	End Time	Days	Temperature	Range
Ramp-Up	7:00 am	7:59 am	Weekdays	70	± 3
Occupied	8:00 am	5:00 pm	Weekdays	73	± 3
Unoccupied	5:01 pm	6:59 am	Weekdays	65	± 3
Unoccupied			Weekend	65	± 3

This could be done via the client module sending the schedule information to the management server. *Id.* at [0056]. A second method was to use one or more occupancy sensors located in the building to directly detect whether occupants were present or not. *E.g., id.* at [0097]; [0102] & Table 8. In either case, the system controlled the temperature of the building according to the occupancy status and the desired temperatures specified for each mode specified in the energy profile. *Id.* Rhee disclosed that the management server could manage (e.g., control) an energy device (e.g., the HVAC system) independently, or jointly with the wireless controllers. *Id.* at [0037]. Thus, a POSITA would have understood that Rhee disclosed determining whether the building was occupied or unoccupied and controlled the HVAC system to provide heating or cooling to the building at

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an operational temperature based on that determination. Ex. G at ¶ 92. A POSITA would understand that the temperature setpoints in the energy profile would cause the disclosed system to control the HVAC system to provide heating or cooling to the building until the specified temperature was reached. *Id.*

- (h) Rhee disclosed the management server determined “whether the building is occupied or unoccupied” based at least in part on “third data from a motion sensor”.

Claim 17 and its dependent claims 18 and 20 require that the “one or more processors” “receive a third data from a motion sensor” that is used to “determine whether the building is occupied or unoccupied”. Claim 10 similarly requires that the “determination of whether the building is occupied or unoccupied by one or more processors” be “based on a third data received from a motion sensor”. Rhee disclosed this limitation. Ex. G at ¶¶ 149-153.

Rhee disclosed a management server that received data from a wireless controller. Ex. C at [0048]. The wireless controller can be connected to any number of sensors or alarms, including “a motion detector”. *Id.* at [0083] & Fig. 4. This sensor data was transmitted to and received by the management server. *Id.* at [0101]-[0102]. Rhee disclosed that an “energy profile” may utilize different “operational modes”, including an “occupied” and “unoccupied modes”, both of which can be triggered by “occupancy sensors”. *Id.* at [0097] & Table 8 (“[O]ccupancy sensors”); *see also* Fig. 9 & [0102] (wireless controller and control

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module manage HVAC system based on “energy profile and/or the sensor data”).

A POSITA would have understood the “occupancy sensors” to refer at least to the wireless motion sensors Ex. G at ¶ 198-201; *see also id.* at ¶ 90. The motion sensor data received by the management server was the claimed “third data”.

Rhee’s disclosures thus taught that the management server received motion sensor data to determine the occupancy of a building.

- (i) Rhee disclosed a first processor that was located remotely from the memory that communicated with the memory.

Claim 1 requires that the one or more processors include a “first processor” “which is located remotely from the memory and is not electrically connected to the memory” that “communicate[s] with the memory”. Rhee disclosed these limitations. Ex. G at ¶¶ 96-104.

As explained above, Rhee disclosed a management server with processors, any of which would be a “first processor”. Rhee also disclosed a memory in the form of a “storage module” used by the management server to store data including the energy profile and energy data. Ex. C at [0060]. Rhee further disclosed that the storage module could be a “secured SQL database” that “can be located remotely from the management server”. *Id.* at [0070]. A POSITA would have appreciated from Rhee’s disclosure that the management server would not be electrically connected to a remotely located SQL database, as each would be separate

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computers with independent electrical circuitry and power supplies. Ex. G at ¶ 98.

The processors of the management server would communicate remotely with the SQL database. Ex. C at [0070]. Thus Rhee disclosed a first processor that was remote from, and not electrically connected to, a memory, where the processor communicated remotely with that memory. Ex. G at ¶¶ 96-100.

- (j) Rhee disclosed a memory that stored historical values of the first and second data.

Claim 1 requires that the “memory is configured to store historical values of the first data and the second data”. Rhee discloses this limitation. Ex. G at ¶¶ 105-108.

As explained above, the management server received measurements of inside temperature (first data) and outside temperature (second data), which were part of the energy data received by the management server. Rhee disclosed that the storage module of the management server stored the energy data. This data was stored over time for use by other components of Rhee’s system, such as displaying a report showing “past indoor and outdoor temperatures”. Ex. C at [0066]; *see also* [0057] (“[E]nvironmental data” can include “inside temperature” and “outside temperature”); [0067] (“As another example, the analysis module 226 creates a [sic] energy savings report based on past indoor and outdoor temperatures.”). A

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POSITA would have appreciated that the past values for the indoor and outdoor temperature stored in the storage module were historical values. Ex. G at ¶ 102.

* * *

Claim 1 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.³

Claim 1	Rhee
I. A system for controlling an HVAC system at a user's building, the system comprising:	<p>“The energy management system 100 further includes a wireless repeater 118, a management server 120, a wireless gateway 130, a network 140, and a client module 150. In one embodiment, <i>the wireless controller 110e manages (e.g., controls, directs, monitors, etc.) an energy device 160 (e.g., heater, air conditioner, lights, windmill, etc.).</i> The wireless repeater 118 forwards and/or routes communications between wireless controller D 110d and wireless controller C 110c via the wireless mesh network thereby extending the range of the wireless mesh network 170. The wireless gateway 130 connects the wireless mesh network 170 to the management server 120 via the network 140. The management server 120 communicates with the wireless controllers 110 via the network 140 (e.g., the internet) and the wireless gateway 130 and transmits part or all of an energy profile to one or more of the wireless controllers 110. The management server 120 also receives energy data from the wireless controllers 110. The client module 150 includes an interface utilized to manage the management server 120 directly or remotely via the network 140.” Ex. C at [0045].</p>

³ All emphasis in the quoted text of the claim charts has been added to the original.

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Claim 1	Rhee
	<p>“The energy management system 100 can be, for example, <i>utilized in a building</i> and/or a group of buildings (e.g., campus, office complex, global office complex, city wide campus, etc.).” <i>Id.</i> at [0046].</p> <p>“As a further example, <i>the wireless controller C 110c manages heating, ventilating, and air conditioning (HVAC) for the office complex.</i> The wireless controller C 110c can manage the HVAC units for the office complex utilizing a wired connection, a wireless connection, and/or a pneumatic controlled connection. The wireless controller C 110c includes a different part of the energy profile for the office complex (i.e., office HVAC energy profile). The office HVAC energy profile includes information as illustrated in Table 2.” <i>Id.</i> at [0052].</p>
[a] a memory; and	<p>“In other examples, <i>the storage module 228 stores the energy data, the modifications to the energy profile, and or the energy profile utilizing a database.</i> For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. The database can be, for example, accessed by the client module 150 and/or the management server 220. In other embodiments, the storage module 228 can be located remotely from the management server 220.” <i>Id.</i> at [0070].</p>
[b] one or more processors with circuitry and code designed to execute instructions;	<p>“The wireless controller E 110e communicates the monitored energy data to the management server 120 via the wireless mesh network 170 and the network 140. <i>The management server 120 manages one or more parts of an energy profile based on the energy data, preferences, and or other information associated with the energy management system 100 (e.g., building holidays, occupancy vacation, weather, power demands, etc.).</i> The energy profile is utilized to distribute the intelligence of the energy management system 100 across the wireless controllers 110 and the</p>

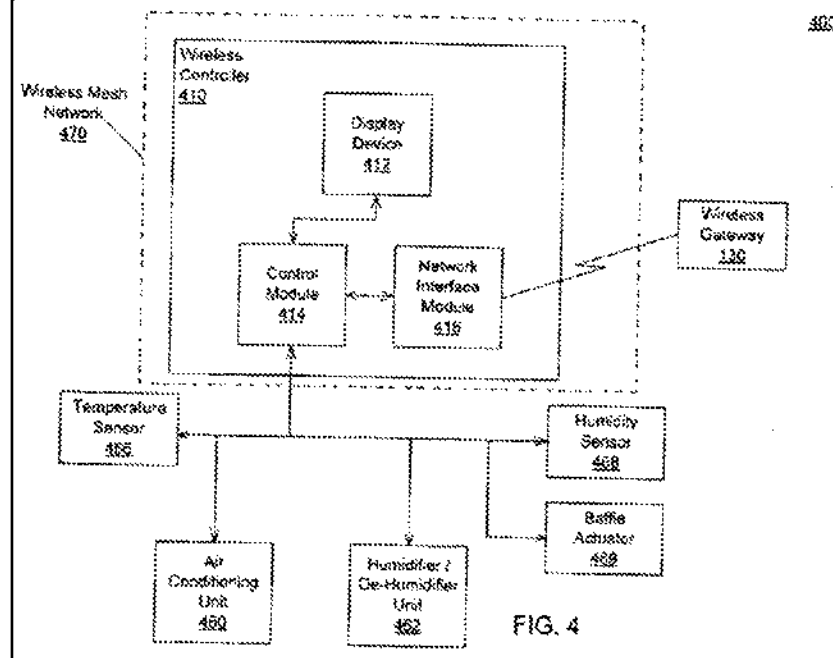
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Claim 1	Rhee
	<p>management server 120. For example, each wireless controller 110 can independently and autonomously manage the energy device 160 based on the energy profile or parts thereof and/or the energy data. An advantage of distributing the intelligence allows for easy deployment and adoption of the energy management system 100 since both the wireless controller 110 and the management server 120 manage the energy policy compliance and optimization.” <i>Id.</i> at [0048].</p> <p>“The above-described systems and methods can be implemented in digital electronic circuitry, in computer hardware, firmware, and/or software. The implementation can be as a computer program product. The implementation can, for example, be in a machine-readable storage device, for execution by, or to control the operation of, data processing apparatus. <i>The implementation can, for example, be a programmable processor, a computer, and or multiple computers.</i>” <i>Id.</i> at [0104].</p> <p>“<i>Method steps can be performed by one or more programmable processors executing a computer program to perform functions of the invention by operating on input data and generating output. Method steps can also be performed by and an apparatus can be implemented as special purpose logic circuitry. The circuitry can, for example, be a FPGA (field programmable gate array) and/or an ASIC (application specific integrated circuit). Modules, subroutines, and software agents can refer to portions of the computer program, the processor, the special circuitry, software, and/or hardware that implements that functionality.</i>” <i>Id.</i> at [0106].</p> <p>“Processors suitable for the execution of a computer program include, by way of example, both general and</p>

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Claim 1	Rhee
	<p>special purpose microprocessors, and any one or more processors of any kind of digital computer. <i>Generally, a processor receives instructions and data from a read-only memory or a random access memory or both.</i> The essential elements of a computer are a processor for executing instructions and one or more memory devices for storing instructions and data. Generally, a computer can include, can be operatively coupled to receive data from and/or transfer data to one or more mass storage devices for storing data (e.g., magnetic, magneto-optical disks, or optical disks).” <i>Id.</i> at [0107].</p>
<p>[c] the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;</p>	<p>“FIG. 9 is a flowchart 900 illustrating management and monitoring of energy devices 460 and 462 by a wireless controller 410 utilizing an energy profile and sensor data as illustrated by FIG. 4. The network interface module 416 receives (910) energy profile modifications from the management server 120 of FIG. 1B and communicates the energy profile modifications to the control module 414. <i>The control module 414 receives (920) sensor data from the temperature sensor 466 and the humidity sensor 468.</i> The control module 414 manages (930) the energy devices (in this example, the air conditioning unit 460 and the humidifier/de-humidifier unit 462) based on the energy profile and/or the sensor data. <i>The control module 414 receives (940) energy data from the energy devices 460 and 462 and sensor data from the sensors 466 and 468 and transmits (950) the energy data and the sensor data to the management sever 120 via the network interface module 416.</i> The network interface module 416 continues to receive (910) energy profile modifications from the management server 120.” <i>Id.</i> at [0102].</p>

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Claim 1**Rhee**

“In some examples, the energy data includes energy consumption data, environmental data, energy generation data, and or any other type of data associated with building management (e.g., direction of windows on the building, prevailing wind, insulation type, oil tank level, propane tank level, alert information, etc.). The energy consumption data can include, for example, energy used by the energy device 160, energy saved by the energy device 160, further energy use by the energy device 160, proposed energy use by the energy device 160, cost of different types of energy, and/or any other type of data associated with the consumption of energy. The environmental data can include, for example, outside temperature, inside temperature, outside humidity, inside humidity, rainfall, sunlight coverage, environmental costs of different types of energy (e.g., cost of one kilowatt of wind power, greenhouse gas emissions for one kilowatt of coal power, etc.), and/or any other data associated with the environment. The energy generation data can include, for example, alternative energy generation level (e.g., solar power generation, wind power generation, etc.), grid

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Claim 1	Rhee
<p>[d] the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet;</p>	<p>power level, and/or any other type of data associated with energy generation.” <i>Id.</i> at [0057].</p> <p>“FIG. 9 is a flowchart 900 illustrating management and monitoring of energy devices 460 and 462 by a wireless controller 410 utilizing an energy profile and sensor data as illustrated by FIG. 4. The network interface module 416 receives (910) energy profile modifications from the management server 120 of FIG. 1B and communicates the energy profile modifications to the control module 414. <i>The control module 414 receives (920) sensor data from the temperature sensor 466 and the humidity sensor 468.</i> The control module 414 manages (930) the energy devices (in this example, the air conditioning unit 460 and the humidifier/de-humidifier unit 462) based on the energy profile and/or the sensor data. <i>The control module 414 receives (940) energy data from the energy devices 460 and 462 and sensor data from the sensors 466 and 468 and transmits (950) the energy data and the sensor data to the management sever 120 via the network interface module 416.</i> The network interface module 416 continues to receive (910) energy profile modifications from the management server 120.” <i>Id.</i> at [0102].</p> <p>“Referring to FIG. 1A, an energy management system 50 is depicted. The energy management system 50 is associated with a building 51 or a series of buildings (e.g., a second building 51', an office complex, a school campus, global offices, commonly-owned buildings, commonly-managed buildings, etc.). The energy management system 50 includes the internet 52, a wireless gateway 53, a wireless repeater 54, a wireless controller A 55a, a wireless controller B 55b, a wireless actuator 57, a wireless sensor 58, and energy devices 59. The building 51 includes a plurality of rooms (e.g., room A 56a and room B 56b). The energy management system 50 is interconnected via a wireless mesh network.</p>

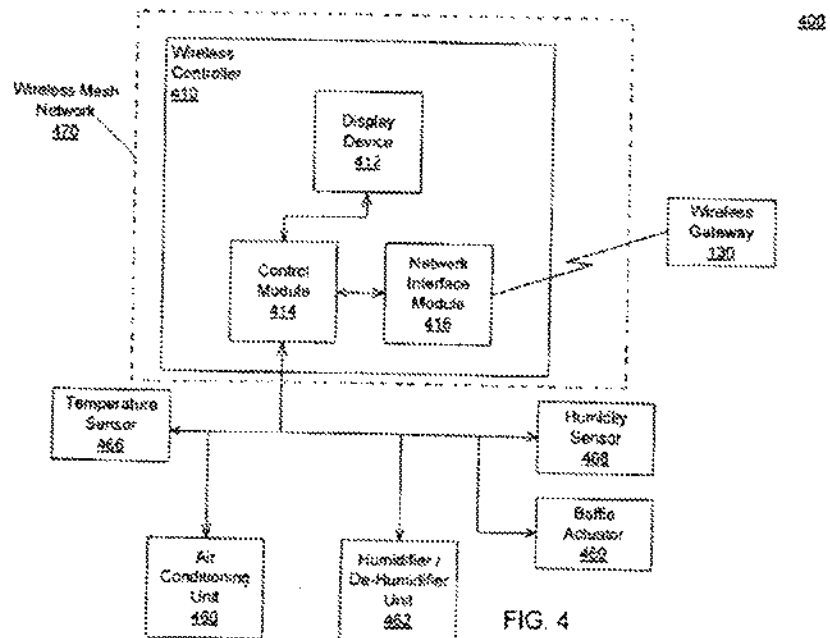
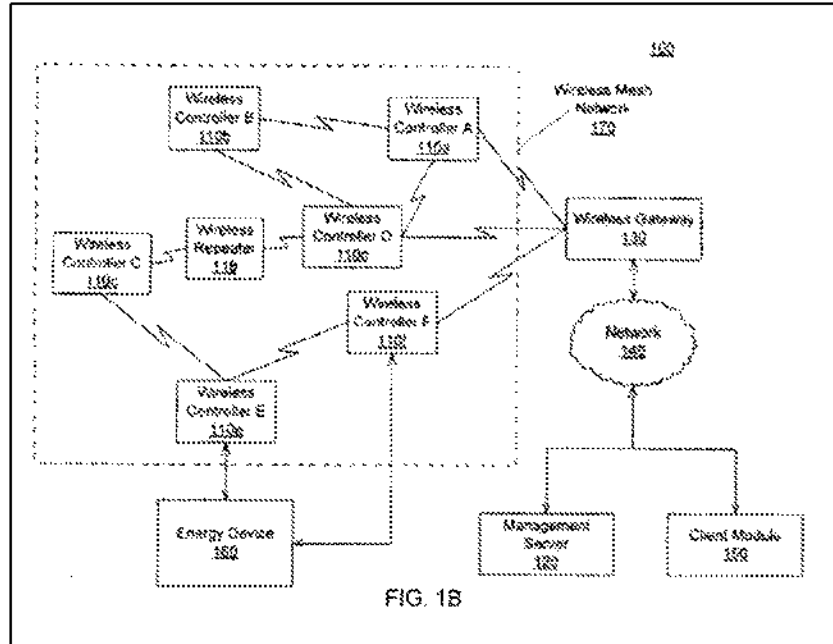
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Claim 1	Rhee
	<p><i>The wireless gateway 53 connects the wireless mesh network with a management server (not shown) via the internet 52. The wireless repeater 54 extends the range of the wireless mesh network by forwarding and/or routing communications between the wireless controllers 55a and 55b, the wireless sensor 58 and/or the wireless actuator 57. The wireless controllers A 55a and B 55b are associated with the rooms A 56a and B 56b, respectfully. The wireless actuator 57 actuates and/or deactuates energy devices and/or any other type of device (e.g., mechanical device, electrical device, etc.). The wireless sensor 58 provide energy data to the wireless controllers A 55a and B 55b and or the management server.” Id. at [0040].</i></p> <p>Referring to FIG. 1B, an energy management system 100 includes wireless controllers 110a, 110b, 110C, 110d, 110e . . . 110n (generally 110) in a wireless mesh network 170. The energy management system 100 further includes a wireless repeater 118, a management server 120, a wireless gateway 130, a network 140, and a client module 150. In one embodiment, the wireless controller 110e manages (e.g., controls, directs, monitors, etc.) an energy device 160 (e.g., heater, air conditioner, lights, windmill, etc.). The wireless repeater 118 forwards and/or routes communications between wireless controller D 110d and wireless controller C 110c via the wireless mesh network thereby extending the range of the wireless mesh network 170. <i>The wireless gateway 130 connects the wireless mesh network 170 to the management server 120 via the network 140. The management server 120 communicates with the wireless controllers 110 via the network 140 (e.g., the internet) and the wireless gateway 130 and transmits part or all of an energy profile to one or more of the wireless controllers 110. The management server 120 also receives energy data from the wireless controllers 110. The client module 150 includes an</i></p>

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Claim 1**Rhee**

interface utilized to manage the management server 120 directly or remotely via the network 140.” *Id.* at [0045].



“In some examples, the energy data includes energy consumption data, environmental data, energy generation data, and or any other type of data

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Claim 1	Rhee																																				
	<p><i>associated with building management (e.g., direction of windows on the building, prevailing wind, insulation type, oil tank level, propane tank level, alert information, etc.). ... The environmental data can include, for example, outside temperature, inside temperature, outside humidity, inside humidity, rainfall, sunlight coverage, environmental costs of different types of energy (e.g., cost of one kilowatt of wind power, greenhouse gas emissions for one kilowatt of coal power, etc.), and/or any other data associated with the environment.” Id. at [0057].</i></p> <p><i>“In other examples, the temperature sensor 466 and/or the humidity sensor 468 are utilized to record and/or analyze data regarding the building and/or the environment. For example, the temperature sensor 466 is placed outside of the building to determine the outside temperature so that the energy profile can be modified based on the weather.” Id. at [0079].</i></p>																																				
[e] the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the	<p><i>“As a further example, the wireless controller C 110c manages heating, ventilating, and air conditioning (HVAC) for the office complex. The wireless controller C 110c can manage the HVAC units for the office complex utilizing a wired connection, a wireless connection, and/or a pneumatic controlled connection. The wireless controller C 110c includes a different part of the energy profile for the office complex (i.e., office HVAC energy profile). The office HVAC energy profile includes information as illustrated in Table 2.” Id. at [0052].</i></p> <div><p style="text-align: center;">TABLE 2</p><table><tr><th colspan="6"><u>Exemplary Office HVAC Energy Profile</u></th></tr><tr><th>Mode</th><th>Start Time</th><th>End Time</th><th>Days</th><th>Temperature</th><th>Range</th></tr><tr><td>Ramp-Up</td><td>7:00 am</td><td>7:59 am</td><td>Weekdays</td><td>76</td><td>±3</td></tr><tr><td>Occupied</td><td>8:00 am</td><td>5:59 pm</td><td>Weekdays</td><td>73</td><td>±3</td></tr><tr><td>Unoccupied</td><td>5:01 pm</td><td>6:59 am</td><td>Weekdays</td><td>65</td><td>±3</td></tr><tr><td>Unoccupied</td><td></td><td></td><td>Weekend</td><td>65</td><td>±3</td></tr></table></div>	<u>Exemplary Office HVAC Energy Profile</u>						Mode	Start Time	End Time	Days	Temperature	Range	Ramp-Up	7:00 am	7:59 am	Weekdays	76	±3	Occupied	8:00 am	5:59 pm	Weekdays	73	±3	Unoccupied	5:01 pm	6:59 am	Weekdays	65	±3	Unoccupied			Weekend	65	±3
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building is unoccupied;	<p>“The wireless controller C 110c manages the heating, ventilating, and air conditioning units for the office complex based on the office HVAC energy profile (i.e., part of the energy profile for the office complex). In these examples, Tables 1 and 2 are parts of an energy profile for the office complex.” <i>Id.</i> at [0052].</p> <p>“FIGS. 6A and 6B illustrate that different parts of the same building can have different settings and/or modes.” <i>Id.</i> at [0093]. <i>See also</i> Figs. 6A & 6B.</p> <p>“In other examples, the energy profile utilizes different operational modes to optimize the energy use under certain conditions. For example, as illustrated in Table 7 above, the classrooms have an Occupied mode and an Unoccupied mode. When the lights are in Occupied mode, then the lights are on and when the lights are in Unoccupied mode, then the lights are off. The automatic and uniform application of the mode utilizing the energy profile advantageously enables the optimally regulation of energy consumption under particular conditions in order to minimize waste. Table 8 illustrates different operational modes in the context of a HVAC unit. Although Table 8 illustrates the different operational modes in the context of a HVAC unit, the different operational modes can be utilized for any type of energy device.” <i>Id.</i> at [0097].</p>

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	<div> <div>TABLE 8</div> <div>Exemplary Operational Modes</div> <table> <tr> <th>Mode</th> <th>Description</th> <th>Temperature</th> <th>Range</th> <th>Trigger</th> </tr> <tr> <td>Occupied</td> <td>Full occupancy</td> <td>Energy profile control or local thermostat</td> <td>Set per comfort range (e.g., 2° degrees)</td> <td>Schedule, occupancy sensors or exit of</td> </tr> <tr> <td>Unoccupied</td> <td>Empty</td> <td>Local thermostat disabled</td> <td>Disabled</td> <td>Override mode</td> </tr> <tr> <td>Override</td> <td>Manual control</td> <td>Local thermostat within energy profile</td> <td>Wider comfort range (e.g., 2° degrees)</td> <td>Schedule or occupancy sensors</td> </tr> <tr> <td>Multi-thermostat</td> <td>Manual control</td> <td>Local thermostat with time limit</td> <td>Maintenance control range (e.g., 10° degrees)</td> <td>Override button</td> </tr> <tr> <td>Demand Response</td> <td>Full occupancy during peak energy consumption</td> <td>Energy profile control</td> <td>Disabled</td> <td>Energy requirements from the electrical grid</td> </tr> <tr> <td>Optimal Generation Source Transition</td> <td>Energy source availability</td> <td>Energy profile control</td> <td>Depends on generation source</td> <td>Energy source availability</td> </tr> <tr> <td></td> <td>HVAC transition from heating to cooling, etc.</td> <td>Energy profile control and/or other factors</td> <td>Not applicable</td> <td>Schedule, outside temperature, weather forecast, and/or historical data</td> </tr> </table> </div>	Mode	Description	Temperature	Range	Trigger	Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., 2° degrees)	Schedule, occupancy sensors or exit of	Unoccupied	Empty	Local thermostat disabled	Disabled	Override mode	Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., 2° degrees)	Schedule or occupancy sensors	Multi-thermostat	Manual control	Local thermostat with time limit	Maintenance control range (e.g., 10° degrees)	Override button	Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid	Optimal Generation Source Transition	Energy source availability	Energy profile control	Depends on generation source	Energy source availability		HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or historical data
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<p>[f] the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;</p>	<p>“In other examples, <i>the client module 150 includes a web-based interface utilized to manage the management server 120 and/or the wireless controllers 110 via the network 140. A user and or an administrator can, for example, access the client module 150 utilizing a transmitting device (e.g., laptop computer with a web browser) and remotely control the system 100.</i> The user and/or the administrator can remotely control the system 100 by directly communicating with the wireless controls 110 or by communicating with the management server 120. The client module 150 can control access via various granular levels of access utilizing a username/password and/or any other type of authentication/authorization mechanism. For example, the user utilizing the client module 150 via the transmitting device can monitor current energy consumption conditions and the wireless mesh network 170 status. The user can also view historical trending charts and analysis reports created by the management server 120. <i>As another example, the user, depending on their access level, can modify the energy</i></p>																																								

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	<p><i>profile (e.g., modify temperature set points for the modes and the schedules). Although FIG. 1B illustrates the client module 150 separate from the management server 120, the client module 150 can be integrated into the management server 120.” Id. at [0056]</i></p> <p><i>“The transmitting device can include, for example, a computer, a computer with a browser device, a telephone, an IP phone, a mobile device (e.g., cellular phone, personal digital assistant (PDA) device, laptop computer, electronic mail device), and or other communication devices. The browser device includes, for example, a computer (e.g., desktop computer, laptop computer) with a world wide web browser (e.g., Microsoft® Internet Explorer® available from Microsoft Corporation, Mozilla® Firefox available from Mozilla Corporation). The mobile computing device includes, for example, a personal digital assistant (PDA).” Id. at [0113].</i></p> <p><i>“The front-end component can, for example, be a client computer having a graphical user interface, a Web browser through which a user can interact with an example implementation, and/or other graphical user interfaces for a transmitting device. The components of the system can be interconnected by any form or medium of digital data communication (e.g., a communication network).</i></p> <p><i>The system can include clients and servers. A client and a server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.” Id. at [0110-0111].</i></p> <p><i>“Examples of communication networks include wired networks, wireless networks, packet-based networks,</i></p>

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	<p><i>and or circuit-based networks. Packet-based networks can include, for example, the Internet, a carrier internet protocol (IP) network (e.g., local area network (LAN), wide area network (WAN), campus area network (CAN), metropolitan area network (MAN), home area network (HAN)), a private IP network, an IP private branch exchange (IPBX), a wireless network (e.g., radio access network (RAN), 802.11 network, 802.16 network, general packet radio service (GPRS) network, HiperLAN), and/or other packet-based networks. Circuit-based networks can include, for example, the public switched telephone network (PSTN), a private branch exchange (PBX), a wireless network (e.g., RAN, bluetooth, code-division multiple access (CDMA) network, time division multiple access (TDMA) network, global system for mobile communications (GSM) network), and/or other circuit-based networks.”</i> <i>Id.</i> at [0112].</p>
<p>[g] the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software</p>	<p>“In other examples, the client module 150 includes a web-based interface utilized to manage the management server 120 and/or the wireless controllers 110 via the network 140. A user and/or an administrator can, for example, access the client module 150 utilizing a transmitting device (e.g., laptop computer with a web browser) and remotely control the system 100. The user and/or the administrator can remotely control the system 100 by directly communicating with the wireless controls 110 or by communicating with the management server 120. <i>The client module 150 can control access via various granular levels of access utilizing a username password and or any other type of authentication authorization mechanism. For example, the user utilizing the client module 150 via the transmitting device can monitor current energy consumption conditions and the wireless mesh network 170 status. The user can also view historical trending charts and analysis reports created by the management server 120. As another example, the user,</i></p>

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Claim 1	Rhee
application code via the Internet;	depending on their access level, can modify the energy profile (e.g., modify temperature set points for the modes and the schedules). Although FIG. 1B illustrates the client module 150 separate from the management server 120, the client module 150 can be integrated into the management server 120.” <i>Id.</i> at [0056]. <i>See also</i> [0066]; [0103].
[h] the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature;	“ <i>In other examples, the energy profile utilizes different operational modes to optimize the energy use under certain conditions. For example, as illustrated in Table 7 above, the classrooms have an Occupied mode and an Unoccupied mode. When the lights are in Occupied mode, then the lights are on and when the lights are in Unoccupied mode, then the lights are off. The automatic and uniform application of the mode utilizing the energy profile advantageously enables the optimally regulation of energy consumption under particular conditions in order to minimize waste. Table 8 illustrates different operational modes in the context of a HVAC unit. Although Table 8 illustrates the different operational modes in the context of a HVAC unit, the different operational modes can be utilized for any type of energy device.</i> ” <i>Id.</i> at [0097].

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Claim 1

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TABLE 8

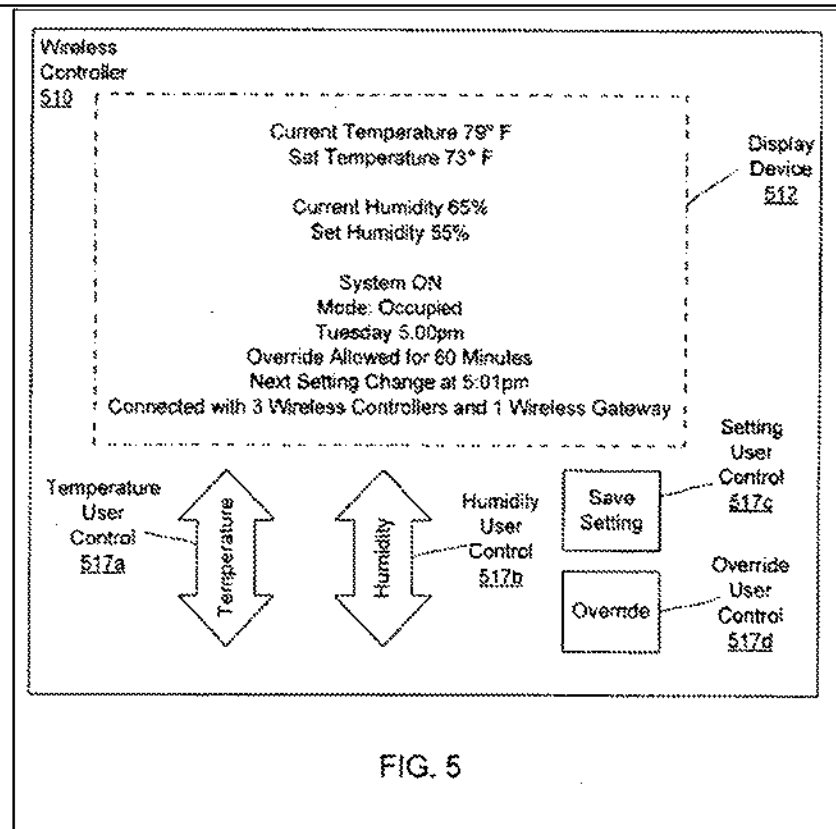
Exemplary Operational Modes				
Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., ± 3 degrees)	Schedule, occupancy sensors or exit of Override mode
Unoccupied	Empty	Local thermostat disabled	Disabled	Schedule or occupancy sensors
Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., ± 5 degrees)	Override button
Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., ± 15 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optimal Generation Source Transition	Energy source availability	Energy profile control	Depends on generation source	Energy source availability
	HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or statistical data

TABLE 2

Exemplary Office HVAC Energy Profile

Mode	Start Time	End Time	Days	Temperature	Range
Ramp-Up	7:00 am	7:59 am	Weekdays	70	± 3
Occupied	8:00 am	5:00 pm	Weekdays	73	± 3
Unoccupied	5:01 pm	6:59 am	Weekdays	65	± 3
Unoccupied			Weekend	65	± 3

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“The wireless controller E 110e communicates the monitored energy data to the management server 120 via the wireless mesh network 170 and the network 140. The management server 120 manages one or more parts of an energy profile based on the energy data, preferences, and or other information associated with the energy management system 100 (e.g., building holidays, occupancy vacation, weather, power demands, etc.). The energy profile is utilized to distribute the intelligence of the energy management system 100 across the wireless controllers 110 and the management server 120. For example, each wireless controller 110 can independently and autonomously manage the energy device 160 based on the energy profile or parts thereof and/or the energy data. An advantage of distributing the intelligence allows for easy deployment and adoption of the energy management system 100 since both the wireless

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	<p>controller 110 and the management server 120 manage the energy policy compliance and optimization.” <i>Id.</i> at [0048].</p> <p>“Generally, the system and method for energy management is reducing the overall energy costs related to energy devices (e.g., air conditioners, lights, fans, etc.). The management of the energy devices can provide a cost-effective solution to energy management by maximizing the effective use of energy-producing devices (e.g., generators, windmills, solar panels, etc.) and minimizing energy use of energy-consuming devices (e.g., air conditioners, heaters, lights, etc.). <i>The management of the energy devices can be performed jointly and independently by a management server and wireless controllers.</i></p> <p>“<i>The management server and the wireless controllers jointly manage an energy profile (e.g., activate the lights at 8:00 am and turn off the lights at 5:00 pm, use solar power from 8:00 am to 12:00 pm, etc.) for the energy devices.</i> The joint management of the energy profile can advantageously provide centralized management of the energy profile while still allowing individualized management of certain features (e.g., temperature ranges, temperature overrides, etc.). The wireless controllers can independently manage the energy devices based on the energy profile which advantageously allows the wireless controllers to operate based on the energy profile without interaction from the management server.” <i>Id.</i> at [0037-0038].</p> <p>“FIG. 9 is a flowchart 900 illustrating management and monitoring of energy devices 460 and 462 by a wireless controller 410 utilizing an energy profile and sensor data as illustrated by FIG. 4. The network interface module 416 receives (910) energy profile modifications from the management server 120 of FIG. 1B and</p>

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	<p>communicates the energy profile modifications to the control module 414. The control module 414 receives (920) sensor data from the temperature sensor 466 and the humidity sensor 468. <i>The control module 414 manages (930) the energy devices (in this example, the air conditioning unit 460 and the humidifier de-humidifier unit 462) based on the energy profile and or the sensor data. The control module 414 receives (940) energy data from the energy devices 460 and 462 and sensor data from the sensors 466 and 468 and transmits (950) the energy data and the sensor data to the management sever 120 via the network interface module 416. The network interface module 416 continues to receive (910) energy profile modifications from the management server 120.</i>" <i>Id.</i> at [0102].</p>
<p>[i] wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;</p>	<p>"Referring to FIG. 2, an energy management system 200 includes a management server 220, a network 140, a wireless gateway 130, and a wireless controller 210 configured in a wireless mesh network 270. The management server 220 communicates via the network 140 to the wireless gateway 130. <i>The management server 220 includes a communication module 222, a profile module 224, an analysis module 226, and a storage module 228.</i> The communication module 222 monitors and receives energy data from the wireless controller 210 via the wireless gateway 130 and the network 140. The profile module 224 manages the energy profile and transmits part or all of the energy profile to the wireless controller 210 via the network 140 and the wireless gateway 130. The analysis module 226 analyzes the energy data received by the communication module 222 and creates modifications to the energy profile managed by the profile module 224. <i>The storage module 228 stores the energy data, the modifications to</i></p>

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	<p><i>the energy profile, and or the energy profile.” Id. at [0060].</i></p> <p>“In other examples, the storage module 228 stores the energy data, the modifications to the energy profile, and/or the energy profile utilizing a database. For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. The database can be, for example, accessed by the client module 150 and/or the management server 220. <i>In other embodiments, the storage module 228 can be located remotely from the management server 220.” Id. at [0070].</i></p>
<p>[j] the first processor with circuitry and code designed to execute instructions to communicate with the memory;</p>	<p>“In other examples, the storage module 228 stores the energy data, the modifications to the energy profile, and/or the energy profile utilizing a database. For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. <i>The database can be, for example, accessed by the client module 150 and or the management server 220.</i> In other embodiments, the storage module 228 can be located remotely from the management server 220.” <i>Id. at [0070].</i></p> <p>“Processors suitable for the execution of a computer program include, by way of example, both general and special purpose microprocessors, and any one or more processors of any kind of digital computer. <i>Generally, a processor receives instructions and data from a read-only memory or a random access memory or both. The essential elements of a computer are a processor for executing instructions and one or more memory devices for storing instructions and data.</i> Generally, a computer can include, can be operatively coupled to receive data from and/or transfer data to one or more mass storage devices for storing data (e.g., magnetic, magneto-optical disks, or optical disks).” <i>Id. at [0107].</i></p>

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[k] wherein the memory is configured to store historical values of the first data and second data.	<p>“In other examples, <i>the storage module 228 stores the energy data</i>, the modifications to the energy profile, and/or the energy profile utilizing a database. For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. The database can be, for example, accessed by the client module 150 and/or the management server 220. In other embodiments, the storage module 228 can be located remotely from the management server 220.” Rhee at [0070].</p> <p>“<i>In some examples, the energy data includes energy consumption data, environmental data, energy generation data, and or any other type of data associated with building management (e.g., direction of windows on the building, prevailing wind, insulation type, oil tank level, propane tank level, alert information, etc.). The energy consumption data can include, for example, energy used by the energy device 160, energy saved by the energy device 160, further energy use by the energy device 160, proposed energy use by the energy device 160, cost of different types of energy, and/or any other type of data associated with the consumption of energy. The environmental data can include, for example, outside temperature, inside temperature, outside humidity, inside humidity, rainfall, sunlight coverage, environmental costs of different types of energy (e.g., cost of one kilowatt of wind power, greenhouse gas emissions for one kilowatt of coal power, etc.), and/or any other data associated with the environment. The energy generation data can include, for example, alternative energy generation level (e.g., solar power generation, wind power generation, etc.), grid power level, and/or any other type of data associated with energy generation.</i>” <i>Id.</i> at [0057].</p> <p>“<i>In some examples, the analysis module 226 accesses energy data (e.g., current energy consumption data,</i></p>

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	<p><i>past energy consumption data, environmental data, etc.) stored on the storage module 228 to create charts and or reports regarding past, present, and or future energy use for the system 200. The charts and/or reports can include, for example, a future energy savings chart/report (e.g., how much will be saved by the energy management system 200, how much can be saved by switching from a HVAC unit to another HVAC unit, etc.), a present energy chart/report (e.g., present use of alternative energy generation, present energy use of lights, etc.), a past energy chart report (e.g., past use of alternative energy generation, past energy use of HVAC units, past indoor and outdoor temperatures, etc.) and/or any other type of chart/report associated with the energy management system 200 (e.g., use of energy by a type of energy device at one building compares to the use of energy of the same energy device at other buildings, energy devices operating at or below optimal efficiency, etc.).</i></p> <p><i>For example, the analysis module 226 creates a energy report for the current inputted by the HVAC unit versus the average temperature outside of the building as recorded by a temperature sensor over the course of the past ten years. As another example, the analysis module 226 creates a time chart for the time between when the Occupied mode is activated until when individual rooms in a zone (e.g., all of the classrooms in a building) reach the set temperature. The time chart can be utilized by the analysis module 226 to modify the energy profile and/or can be utilized by the administrator to determine if the energy unit (e.g., HVAC unit) is underperforming, requires maintenance, and/or if any other issues exist for the rooms. As another example, the analysis module 226 creates a energy savings report based on past indoor and outdoor temperatures. The energy savings report can include, for example, the energy saved by the energy management</i></p>

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	system 200 (e.g., 15% of hearing energy was saved due to the energy management system 200 during the last two months; 25% of cooling energy was saved last quarter by optimized temperature ranges, etc.).” <i>Id.</i> at [0066-0067].

* * *

Claim 17 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 17	Rhee
17. A system for controlling an HVAC system at a user's building, the system comprising:	<i>See supra</i> claim 1 claim chart.
[a] a memory; and	<i>See supra</i> claim 1 claim chart at element 1[a].
[b] one or more processors with circuitry and code designed to execute instructions;	<i>See supra</i> claim 1 claim chart at element 1[b].
[c] the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;	<i>See supra</i> claim 1 claim chart at element 1[c]; claim 4 claim chart.
[d] the one or more	<i>See supra</i> claim 1 claim chart at element 1[d]; claim

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Claim 17	Rhee
processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature, wherein the second data from the network connection is received via the Internet;	5 claim chart.
[e] the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;	<i>See supra</i> claim 1 claim chart at element 1[e].
[f] the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by	<i>See supra</i> claim 1 claim chart at claim 1[f].

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Claim 17	Rhee
<p>way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;</p>	
<p>[g] the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface via on mobile, wireless device running software application code via the Internet;</p>	<p><i>See supra</i> claim 1 claim chart at element 1[g].</p>
<p>[h] the one or more processors with circuitry and code designed to execute instructions to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least</p>	<p><i>See infra</i> claim 10 claim chart and elements 10[pre]-10[a].</p>

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<p>in part on the third data;</p> <p>[i] the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied;</p>	<p>“Each wireless controller 110 manages at least one energy device based on one or more parts of an energy profile. An advantage to the management of energy devices by the wireless controller 110 is that each individual wireless controller 110 can implement and enforce the appropriate energy management policy that can effectively manage energy consumption. In one embodiment, the wireless controller E 110e manages the energy device 160. The wireless controller E 110e can, for example, manage the energy device 160 directly by utilizing a wired connection (e.g., serial connection, ethernet connection, fiber optic connection, etc.) and/or wireless connection (e.g., wireless personal area network, cellular phone network, etc.) between the energy device 160 and the wireless controller E 110e. The wireless controller E 110e can, for example, monitor the energy device 160 indirectly by utilizing one or more sensors (not shown).” Ex. C at [0047]</p> <p>“The wireless controller E 110e communicates the monitored energy data to the management server 120 via the wireless mesh network 170 and the network 140. The management server 120 manages one or more parts of an energy profile based on the energy data, preferences, and/or other information associated with the energy management system 100 (e.g., building holidays, occupancy vacation, weather, power demands, etc.). The energy profile is utilized to distribute the intelligence of the energy management system 100 across the wireless controllers 110 and the management server 120. For example, each wireless controller 110 can independently and autonomously manage the energy device 160 based on the energy profile or parts thereof and/or the energy data. An advantage of</p>

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Claim 17	Rhee																																										
	<p>distributing the intelligence allows for easy deployment and adoption of the energy management system 100 since both the wireless controller 110 and the management server 120 manage the energy policy compliance and optimization.” <i>Id.</i> at [0048].</p> <p>“As a further example, the wireless controller C 110c manages heating, ventilating, and air conditioning (HVAC) for the office complex. The wireless controller C 110c can manage the HVAC units for the office complex utilizing a wired connection, a wireless connection, and/or a pneumatic controlled connection. The wireless controller C 110c includes a different part of the energy profile for the office complex (i.e., office HVAC energy profile). The office HVAC energy profile includes information as illustrated in Table 2.” <i>Id.</i> at [0052].</p> <table><tr><th colspan="6">TABLE 2</th></tr><tr><th colspan="6"><u>Exemplary Office HVAC Energy Profile</u></th></tr><tr><th>Mode</th><th>Start Time</th><th>End Time</th><th>Days</th><th>Temperature</th><th>Range</th></tr><tr><td>Ramp-Up</td><td>7:00 am</td><td>7:59 am</td><td>Weekdays</td><td>70</td><td>± 3</td></tr><tr><td>Occupied</td><td>8:00 am</td><td>5:00 pm</td><td>Weekdays</td><td>73</td><td>± 3</td></tr><tr><td>Unoccupied</td><td>5:01 pm</td><td>6:59 am</td><td>Weekdays</td><td>65</td><td>± 3</td></tr><tr><td>Unoccupied</td><td></td><td></td><td>Weekend</td><td>65</td><td>± 3</td></tr></table> <p>“Each wireless controller A 55a and B 55b manages the energy devices 59 associated with the respective room based on an energy profile and/or energy data (e.g., environmental data, energy consumption data, energy generation data, etc.). <i>For example, the wireless controller A 55a directs the heating unit (i.e., one of the energy devices 59) to activate and heat the room A 56a.</i> As part of the heating of the room A 56a, the wireless controller A 55a directs the wireless actuator 57 to actuate a baffle and a fan to force a limited amount of outside air into room A</p>	TABLE 2						<u>Exemplary Office HVAC Energy Profile</u>						Mode	Start Time	End Time	Days	Temperature	Range	Ramp-Up	7:00 am	7:59 am	Weekdays	70	± 3	Occupied	8:00 am	5:00 pm	Weekdays	73	± 3	Unoccupied	5:01 pm	6:59 am	Weekdays	65	± 3	Unoccupied			Weekend	65	± 3
TABLE 2																																											
<u>Exemplary Office HVAC Energy Profile</u>																																											
Mode	Start Time	End Time	Days	Temperature	Range																																						
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Unoccupied			Weekend	65	± 3																																						

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Claim 17	Rhee
	<p>55a.” <i>Id.</i> at [0041].</p> <p>“In other examples, the energy profile utilizes different operational modes to optimize the energy use under certain conditions. For example, as illustrated in Table 7 above, the classrooms have an Occupied mode and an Unoccupied mode. When the lights are in Occupied mode, then the lights are on and when the lights are in Unoccupied mode, then the lights are off. The automatic and uniform application of the mode utilizing the energy profile advantageously enables the optimally regulation of energy consumption under particular conditions in order to minimize waste. Table 8 illustrates different operational modes in the context of a HVAC unit. Although Table 8 illustrates the different operational modes in the context of a HVAC unit, the different operational modes can be utilized for any type of energy device.” <i>Id.</i> at [0097].</p>

TABLE 8				
<u>Exemplary Operational Modes</u>				
Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., 65 degrees)	Schedule, occupancy sensor or cost of Override mode
Unoccupied	Empty	Local thermostat disabled	Disabled	Schedule or occupancy sensor Override button
Override	Manual control	Local thermostat within energy profile	Wide variation range (e.g., 55 degrees)	Override button
Adaptive/usage	Manual control	Local thermostat with time limit	Maximum/minimum range of range (e.g., +10 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optimal Generation Source Transition	Energy source availability (HVAC) machine from heating to cooling, etc.	Energy profile control and/or other factors	Depend on generation source Not applicable	Energy source availability Schedule, outside temperature, weather forecast, and/or statistical data

[j] wherein the one or See *supra* claim 1 claim chart at element 1[i].

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Claim 17	Rhee
more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;	
[k] the first processor with circuitry and code designed to execute instructions to communicate with the memory;	<i>See supra</i> claim 1 claim chart at element 1[j].
[l] wherein the memory is configured to store historical values of the first data and second data.	<i>See supra</i> claim 1 claim chart at element 1[k].

3. Rhee disclosed the dependent limitations of claim 2 (which depends from claim 1).

Claim 2 requires that “the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.”

Rhee disclosed these limitations. Ex. G at ¶¶ 109-111.

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As explained above, Rhee disclosed that the system was able to determine that the building was unoccupied based on a schedule or occupancy sensor. (*See supra* Section VI.B.2(g).)

Rhee further disclosed that the system could control the HVAC system to implement a setpoint corresponding to a desired temperature when the building is unoccupied based on the determination that the building is unoccupied.

TABLE 2

<u>Exemplary Office HVAC Energy Profile.</u>					
Mode	Start Time	End Time	Days	Temperature	Range
Ramp-Up	7:00 am	7:59 am	Weekdays	70	± 3
Occupied	8:00 am	5:00 pm	Weekdays	73	± 3
Unoccupied	5:01 pm	6:59 am	Weekdays	65	± 3
Unoccupied			Weekend	65	± 3

As explained above, the system controlled the temperature of the building based on whether the building was unoccupied and the desired “unoccupied” temperatures specified in the energy profile. (*See supra* Section VI.B.2(g).)

* * *

Claim 2 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 2	Rhee
2. The system of claim 1:	<i>See supra</i> claim 1 claim chart.

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Claim 2	Rhee
[a] wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.	<i>See supra</i> claim 1 claim chart at element I[h].

4. Rhee disclosed the dependent limitations of claim 3 (which depends from claim 1).

Claim 3 requires that “the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.” Rhee disclosed these limitations. Ex. G at ¶¶ 109-111.

As explained above, Rhee disclosed that the system was able to determine that the building was occupied based on a schedule or occupancy sensor. (*See supra* Section VI.B.2(g).)

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Rhee further disclosed that the system could control the HVAC system to implement a setpoint corresponding to a desired temperature when the building is unoccupied based on the determination that the building is occupied.

TABLE 2

<u>Exemplary Office HVAC Energy Profile.</u>					
Mode	Start Time	End Time	Days	Temperature	Range
Ramp-Up	7:00 am	7:59 am	Weekdays	70	± 3
Occupied	8:00 am	5:00 pm	Weekdays	73	± 3
Unoccupied	5:01 pm	6:59 am	Weekdays	65	± 3
Unoccupied			Weekend	65	± 3

As explained above, the system controlled the temperature of the building based on whether the building was occupied and the desired “occupied” temperatures specified in the energy profile. (*See supra* Section VI.B.2(g).)

* * *

Claim 3 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 3	Rhee
3. The system of claim 1:	<i>See supra</i> claim 1 claim chart.
[a] wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building	<i>See supra</i> claim 1 claim chart at element 1[h].

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Claim 3	Rhee
is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.	

5. Rhee disclosed the dependent limitations of claim 4 (which depends from claims 1 and 2).

Claim 4 requires that the “first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor”. Rhee disclosed this limitation. Ex. G at ¶¶ 115-117.

As explained above, Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the inside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. Figure 4 of Rhee illustrates how the inside temperature of the building (as well as other characteristics) was measured using a temperature sensor and transmitted via a wireless gateway to the management server. *Id.* at [0074]-[0075]; [0079]. Rhee’s disclosures indicated that the data received by the management server included inside temperature measured by a temperature sensor

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in the building, as well as other characteristics of the building. Ex. G at ¶ 116.

(*See supra* Section VI.B.2(b).)

* * *

Claim 4 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 4	Rhee
4. The system of claim 2:	<i>See supra</i> claim 1 claim chart; claim 2 claim chart.
[a] wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.	<i>See supra</i> claim 1 claim chart at element 1[c].

6. Rhee disclosed the dependent limitations of claim 5 (which depends from claims 1, 2, and 4).

Claim 5 requires that the “the second data from the network connection comprises a measurement of the current outdoor temperature”. Rhee disclosed this limitation. Ex. G at ¶¶ 118-120.

As explained above, Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the outside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. The management server received this data from a connection to the

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Internet (which was a network). *Id.* at [0040]; [0045]. Rhee further disclosed that the outside temperature was measured by a temperature sensor “placed outside the building”. *Id.* at [0079]. The outside temperature measurements were used by the analysis module, which was part of the management server. *Id.* at [0067] (“[T]he analysis module 226 creates a [sic] energy report for the current inputted by the HVAC unit versus the average temperature outside of the building as recorded by a temperature sensor over the course of the past ten years.”). Rhee’s disclosures indicated that the data received by the management server via its Internet connection included outside temperature measurements collected by a temperature sensor outside of and hence external to the building. Ex. G at ¶ 119. (*See supra* Section VI.B.2(c).)

* * *

Claim 5 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 5	Rhee
5. The system of claim 4:	<i>See supra</i> claim 1 claim chart; claim 2 claim chart; claim 4 claim chart.
[a] wherein the second data from the network connection comprises a measurement of the current outdoor temperature.	<i>See supra</i> claim 1 claim chart at element 1[d].

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7. Rhee disclosed the dependent limitations of claim 6 (which depends from claims 1, 2, and 4).

Claim 6 requires that the “one or more processors with circuitry and code designed to execute instructions queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied”. Rhee disclosed this limitation. Ex. G at ¶¶ 121-126.

As explained above in Sections VI.B.2(g) and VI.B.3-4, Rhee disclosed that the system could be configured to implement specific temperature setpoints based on certain triggers, including based on the determination of whether the building is occupied or unoccupied. Rhee further disclosed querying the user to confirm whether to change a setpoint. Ex. C at [0078] (“For example, the user requests the control module 414 to decrease the temperature from 68° to 66°. The control module 414 further queries the user to ensure that the user desires to decrease the temperature based on the energy costs . . .”). In other words, Rhee’s system would determine temperature setpoints based on a profile and occupancy determinations. *See id.* at Table 8. The user could then request changes in temperature or override the system-determined setpoints. *Id.* at [0085]. The system would then query the user to confirm those changes. *Id.* at [0078].

A POSITA would appreciate that Rhee disclosed each step in the claimed sequence of events: (1) determine whether the building is occupied or unoccupied;

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then (2) query the user to confirm whether to change to a different setpoint. A POSITA would further appreciate that Rhee's step of querying the user meets this limitation, and the fact that Rhee also disclosed an *additional* step of checking energy costs does not change that fact. Ex. G at ¶ 123.

Alternatively, it would have been obvious to modify the system described in Rhee to query the user to confirm any automatic change of setpoint, since the change would affect both the user's comfort and their energy costs, and the system's determination of occupancy based on a sensor or schedule may not always accurately reflect the true occupancy status. *Id.* at ¶ 125.

* * *

Claim 6 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 6	Rhee
6. The system of claim 4:	<i>See supra</i> claim 1 claim chart; claim 2 claim chart; claim 4 claim chart.
[a] wherein the one or more processors with circuitry and code designed to execute instructions queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.	<i>See supra</i> claim 1 claim chart at element 1[h]; claim 2 claim chart at element 2[a]; claim 3 claim chart at element 3[a]. “In some examples, the wireless controller operates autonomously based on the one or more parts of the energy profile. <i>The control module allows for manual user control of the wireless controller.</i> The control module stores the one or more parts of the energy profile. The wireless controller routes and/or forwards communications via a wireless mesh network.” Ex. C at [0022].

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Claim 6	Rhee
	<p>“The network interface module 416 receives part or all of an energy profile via the wireless mesh network 470 from the wireless gateway 130. The part or all of the energy profile is communicated from the network interface module 416 to the control module 414. <i>The control module 414 manages the air conditioner unit 460 and the humidifier de-humidifier unit 462 based on part or all of the energy profile and or on data received from temperature sensor 466 and humidity sensor 468.</i> The display device 412 provides visual (e.g., flashing lights, color, intensities, text, graphics, etc.), audio (e.g., bells, tones, tunes, voice, etc.), and/or tactile communication to users of the wireless controller 410. In other embodiments, the display device 412 provides advertisements, local information (e.g., town meetings, baseball game information, etc.), national information, and/or any other type of information communicated by a visual, audio, and/or tactile communication.” <i>Id.</i> at [0076].</p> <p>“In some examples, the control module 414 determines the cost of utilizing the air conditioning unit 460 based on the energy costs of the energy source (e.g., line power). The control module 414 can utilize the display device 412 to communicate the energy costs to the user. <i>For example, the user requests the control module 414 to decrease the temperature from 68° to 66°. The control module 414 further queries the user to ensure that the user desires to decrease the temperature based on the energy costs (e.g., ten dollars per day, etc.) and or environmental costs (e.g., four pounds of carbon dioxide produced, etc.). In other words, the control module 414 requires the user to confirm the request for the energy device after communicating the</i></p>

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Claim 6	Rhee
	<p><i>energy costs and or environmental costs of the user's request.” Ex. C at [0078].</i></p> <p>“FIG. 5 shows an example of a wireless controller 510 providing thermostat functions. <i>The wireless controller 510 includes a display device 512, a temperature user control 517a, a humidity user control 517b, a setting user control 517c, and an override user control 517d. A user can adjust the temperature and humidity levels of the room serviced by wireless controller 510 via the temperature user control 517a and the humidity user control 517b, respectively, within the limits of all or part of the energy profile. The user can override the settings as defined by the energy profile by utilizing the override user control 517d. The override user control 517d can be used to temporarily (e.g., sixty minutes, one day, etc.) override the mode settings. The user can also save the updated setting and/or request that the updated setting be saved by utilizing the setting user control 517c. An advantage of utilizing the user controls is that the energy management system 100 is easy to use and is similar to existing user controls for energy systems and thus more efficient to use and learn by the user (i.e., better user compliance for energy management). It should be noted that existing thermostat devices can be utilized in conjunction with the wireless controller 510 to reduce the cost of retrofitting the energy management system 500.” Id. at [0085].</i></p>

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Claim 6	Rhee																																																		
	<table><tr><th colspan="5">TABLE 8</th></tr><tr><th colspan="5"><u>Thermostat Operational Modes</u></th></tr><tr><th>Mode</th><th>Description</th><th>Temperature</th><th>Range</th><th>Trigger</th></tr><tr><td>Occupied</td><td>Full occupancy control or local thermostat</td><td>Energy profile control or local thermostat</td><td>Set per condition range (e.g., 65 degrees)</td><td>Schedule, occupancy sensors or motion</td></tr><tr><td>Unoccupied</td><td>Simple</td><td>Local thermostat disabled</td><td>Disabled</td><td>Override mode</td></tr><tr><td>Override</td><td>Manual control</td><td>Local thermostat with energy profile</td><td>Water comfort range (e.g., 65 degrees)</td><td>Schedule or occupancy sensors</td></tr><tr><td>Maintenance</td><td>Manual control</td><td>Local thermostat with time limit</td><td>Maintenance control range (e.g., 80 degrees)</td><td>Override button</td></tr><tr><td>Demand Response</td><td>Full occupancy during peak energy consumption</td><td>Energy profile control</td><td>Disabled</td><td>Energy requirements from the electrical grid</td></tr><tr><td>Optimal Control/Adaptation</td><td>Energy source availability</td><td>Energy profile control</td><td>Depends on generation source</td><td>Energy source availability</td></tr><tr><td>Transition</td><td>HVAC transition from heating to cooling, etc.</td><td>Energy profile control and/or other factors</td><td>Not applicable</td><td>Schedule, outside temperature, weather forecast, and/or statistical data</td></tr></table>	TABLE 8					<u>Thermostat Operational Modes</u>					Mode	Description	Temperature	Range	Trigger	Occupied	Full occupancy control or local thermostat	Energy profile control or local thermostat	Set per condition range (e.g., 65 degrees)	Schedule, occupancy sensors or motion	Unoccupied	Simple	Local thermostat disabled	Disabled	Override mode	Override	Manual control	Local thermostat with energy profile	Water comfort range (e.g., 65 degrees)	Schedule or occupancy sensors	Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., 80 degrees)	Override button	Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid	Optimal Control/Adaptation	Energy source availability	Energy profile control	Depends on generation source	Energy source availability	Transition	HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or statistical data
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8. Rhee disclosed the dependent limitations of claim 7 (which depends from claim 1).

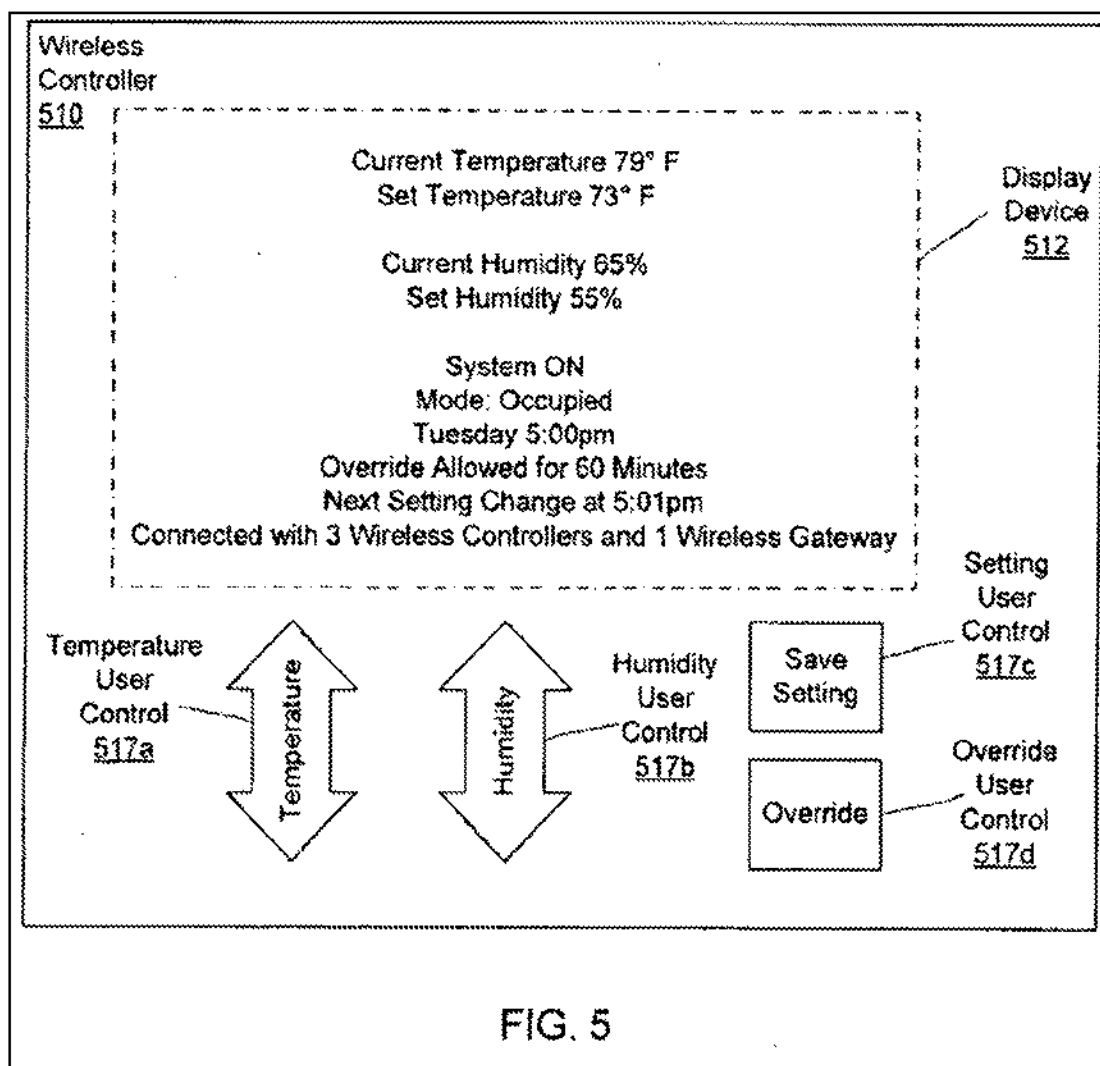
Claim 7 requires that the “one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.” Rhee disclosed this limitation. Ex. G at ¶¶ 127-132.

Rhee disclosed that the wireless controller of the building receives at least one setting of the HVAC system. For example, Figure 5 shows the wireless controller displaying numerous settings of the HVAC system, including system status (*i.e.*, “on” or “off”), system mode (“occupied” or “unoccupied”), current temperature setpoint, and scheduled setting changes (“Next **Setting** Change at

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5:01pm”) (emphasis added). *See also* Ex. C at [0085]-[0086]. A POSITA would recognize that HVAC system status, mode, setpoint, and scheduled changes are settings of the HVAC system. Ex. G at ¶ 128. Rhee further discloses that the wireless controller transmits data, including energy data and energy consumption data to the management server. Ex. C at [0060]. This data includes settings for the HVAC system, including at least mode and temperature setpoints. *Id.* at Table 4. A POSITA would understand from these disclosures that the management server received settings of the HVAC system, including the temperature setpoint, the mode, and the system status (“on” or “off”). Ex. G at ¶ 129. These settings would be needed so that the user could manage the system and the wireless controller using the web-based interface. Ex. C at [0056]; Ex. G at ¶ 129. Further, Rhee disclosed that current and past energy data was used in the management server’s analysis module. Ex. C at [0066]. It would also have been obvious to a POSITA that the management server processors received energy data including HVAC settings, so that the data could be stored, used in the analysis module, and made available to the user through the client module. Ex. G at ¶ 130.

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* * *

Claim 7 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 7	Rhee
7. The system of claim 1:	<i>See supra</i> claim 1 claim chart.
[a] wherein the one or more processors with circuitry and code designed to execute instructions receives at least one setting	"FIG. 5 shows an example of a wireless controller 510 providing thermostat functions. The wireless controller 510 includes a display device 512, a temperature user control 517a, a humidity user control 517b, a setting user control 517c, and an

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Claim 7	Rhee
of the HVAC system.	<p><i>override user control 517d.</i> A user can adjust the temperature and humidity levels of the room serviced by wireless controller 510 via the temperature user control 517a and the humidity user control 517b, respectively, within the limits of all or part of the energy profile. <i>The user can override the settings as defined by the energy profile by utilizing the override user control 517d. The override user control 517d can be used to temporarily (e.g., sixty minutes, one day, etc.) override the mode settings. The user can also save the updated setting and or request that the updated setting be saved by utilizing the setting user control 517c.</i> An advantage of utilizing the user controls is that the energy management system 100 is easy to use and is similar to existing user controls for energy systems and thus more efficient to use and learn by the user (i.e., better user compliance for energy management). It should be noted that existing thermostat devices can be utilized in conjunction with the wireless controller 510 to reduce the cost of retrofitting the energy management system 500.</p> <p>For example, the wireless controller 510 is utilizing the HVAC energy profile as illustrated in Table 2 to manage the operation of a HVAC unit. <i>As illustrated by the display device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON). As illustrated by the display device 512, the next mode change is at 5:01 pm (in this example, the mode change is from Occupied to Unoccupied). The user can override the Occupied mode setting by adjusting the temperature utilizing the temperature user control 517 a.</i> As illustrated in Table 3, at 7:00</p>

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Claim 7	Rhee
	<p>am on Tuesday morning, the user overrode the Ramp-Up mode setting and increased the temperature from 70 degrees to 73 degrees. In addition, the redundant connection oriented design of the wireless mesh network 170 is illustrated in the display device 512 via the wireless connection with three other wireless controllers and one wireless gateway (e.g., wireless controller D 110d of FIG. 1B).”. Ex. C at [0085]-[0086].</p> <div> <p style="text-align: center;">FIG. 5</p> </div> <p><i>Id.</i> at Fig. 5.</p>

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9. Rhee disclosed the dependent limitations of claim 8 (which depends from claims 1 and 7).

Claim 8 requires that the “the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.” Rhee disclosed this limitation. Ex. G at ¶¶ 135-138.

As explained above in Section VI.B.8, Rhee disclosed that the wireless controller of the building receives whether the HVAC system is currently on or off. For example, Figure 5 shows the wireless controller displaying numerous settings of the HVAC system, including whether the HVAC system is on or off. *See also* Ex. C at [0085]-[0086] (“As illustrated by the display device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON)”). A POSITA would have further appreciated that the management server and client module would also receive the setting, so that a user could manage the system, including the management server and the wireless controller through the client module. *Id.* at [0056]; Ex. G at ¶¶ 136-38.

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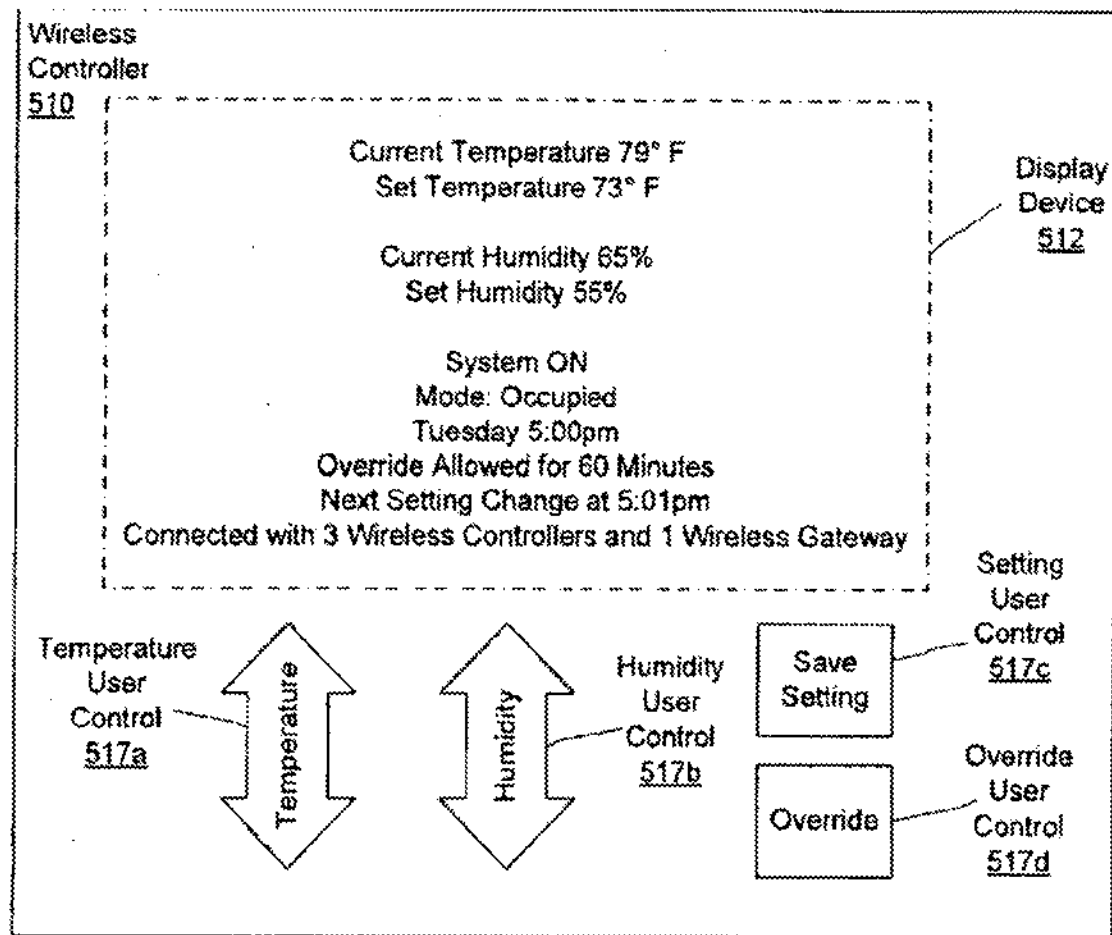


FIG. 5

* * *

Claim 8 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 8	Rhee
8. The system of claim 7:	<i>See supra</i> claim 1 claim chart; claim 7 claim chart.
[a] wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.	<i>See supra</i> claim 7 claim chart at element 7[a].

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10. Rhee disclosed all elements of dependent claim 9 (which depends from claims 1 and 7).

Claim 9 requires that the “the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.” Rhee disclosed this limitation. Ex. G at ¶¶ 142-145.

Rhee disclosed that the system will “transition” the HVAC system “from heating to cooling” based on the schedule, outside temperature, weather forecast, and other triggers. Ex. C at Table 8; *see also id.* at [0041] (the wireless controller “directs the heating unit (i.e., one of the energy devices 59) to activate and heat the room”). A POSITA would have therefore understood that the management server receives and manages the HVAC system’s mode as part of the energy profile. Ex. G at ¶ 143.

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TABLE 8

Exemplary Operational Modes				
Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., ± 3 degrees)	Schedule, occupancy sensors or exit of
Unoccupied	Empty	Local thermostat disabled	Disabled	Override mode
Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., ± 5 degrees)	Schedule or occupancy sensors
Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., ± 10 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optional Generation Source	Energy source availability	Energy profile control	Depends on generation source	Energy source availability
Transition	HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or statistical data

A POSITA would have further appreciated that the management server and client module would also receive the setting, so that a user could manage the system, including the management server and the wireless controller through the client module. Ex. G at ¶ 144.

* * *

Claim 9 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 9	Rhee
9. The system of	<i>See supra</i> claim 1 claim chart; claim 7 claim chart.

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Claim 9	Rhee																																								
claim 7:																																									
[a] wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.	<p>See supra claim 7 claim chart at element 7[a];</p> <p>TABLE 8</p> <table><tr><th colspan="5">Exemplary Operational Modes</th></tr><tr><th>Mode</th><th>Description</th><th>Temperature</th><th>Range</th><th>Trigger</th></tr><tr><td>Occupied</td><td>Full occupancy</td><td>Energy profile control or local thermostat</td><td>Set per comfort range (e.g., ± 3 degrees)</td><td>Schedule, occupancy sensors or exit of Override mode</td></tr><tr><td>Unoccupied</td><td>Empty</td><td>Local thermostat disabled</td><td>Disabled</td><td>Schedule or occupancy sensors</td></tr><tr><td>Override</td><td>Manual control</td><td>Local thermostat within energy profile</td><td>Wider comfort range (e.g., ± 5 degrees)</td><td>Override button</td></tr><tr><td>Maintenance</td><td>Manual control</td><td>Local thermostat with time limit</td><td>Maintenance control range (e.g., ± 10 degrees)</td><td>Override button</td></tr><tr><td>Demand Response</td><td>Full occupancy during peak energy consumption</td><td>Energy profile control</td><td>Disabled</td><td>Energy requirements from the electrical grid</td></tr><tr><td>Optimal Generation Source Transition</td><td>Energy source availability HVAC transition from heating to cooling, etc.</td><td>Energy profile control and/or other factors</td><td>Depends on generation source Not applicable</td><td>Energy source availability Schedule, outside temperature, weather forecast, and/or statistical data</td></tr></table> <p>“Each wireless controller A55a and B 55b manages the energy devices 59 associated with the respective room based on an energy profile and/or energy data (e.g., environmental data, energy consumption data, energy generation data, etc.). For example, the wireless controller A55a directs the heating unit (i.e., one of the energy devices 59) to activate and heat the room A56a. As part of the heating of the room A 56a, the wireless controller A55a directs the wireless actuator 57 to actuate a baffle and a fan to force a limited amount of outside air into room A55a.” <i>Id.</i> at [0041].</p>	Exemplary Operational Modes					Mode	Description	Temperature	Range	Trigger	Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., ± 3 degrees)	Schedule, occupancy sensors or exit of Override mode	Unoccupied	Empty	Local thermostat disabled	Disabled	Schedule or occupancy sensors	Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., ± 5 degrees)	Override button	Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., ± 10 degrees)	Override button	Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid	Optimal Generation Source Transition	Energy source availability HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Depends on generation source Not applicable	Energy source availability Schedule, outside temperature, weather forecast, and/or statistical data
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Optimal Generation Source Transition	Energy source availability HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Depends on generation source Not applicable	Energy source availability Schedule, outside temperature, weather forecast, and/or statistical data																																					

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11. Rhee disclosed the dependent limitations of claim 10 (which depends from claims 1, 2 and 4).

Claim 10 requires that the “determination of whether the building is occupied or unoccupied by one or more processors” be “based on a third data received from a motion sensor”. Rhee disclosed this limitation. Ex. G at ¶¶ 149-153.

Rhee disclosed a management server that received data from a wireless controller. Ex. C at [0048]. The wireless controller can be connected to any number of sensors or alarms, including “a motion detector”. *Id.* at [0083] & Fig. 4. This sensor data was transmitted to and received by the management server. *Id.* at [0101]. Rhee disclosed that an occupancy determination may be part of the “energy profile”. *Id.* at [0097] & Table 8. An “energy profile” may utilize different “operational modes”, including “occupied” and “unoccupied modes”, both of which can be triggered by “occupancy sensors”. *Id.*; *see also id.* at [0083]; Fig. 9 & [0102] (wireless controller and control module manage HVAC system based on “energy profile and/or the sensor data”). A POSITA would have understood the “occupancy sensors” to refer at least to the wireless motion sensors. Ex. G at ¶ 152. The motion sensor data received by the management server was the claimed “third data”. Rhee’s disclosures thus indicated that the management

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server received motion sensor data to determine the occupancy of a building or structure.

* * *

Claim 10 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 10	Rhee
10. The system of claim 4:	<i>See supra</i> claim 1 claim chart; claim 2 claim chart; claim 4 claim chart.
[a] wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.	<p>“Although FIG. 4 illustrates the temperature sensor 466 and the humidity sensor 468, the energy management system 400 can include any type of sensor and/or alarm. The sensor can include a flow meter (e.g., water meter, gas meter, etc.), a power meter, a current meter, a battery meter, a pulse meter (e.g., network pulse, a human/animal pulse, etc.), a input/output node (e.g., monitor analog input/output, monitor digital input/output, etc.), a light sensor, a <i>motion detector</i>, a proximity sensor, a heat sensor, a network sensor, and/or any other type of sensor. The sensor can measure the environmental level of the particles of the materials and/or gases. The alarm can include an audible alarm, a flashing alarm, an automated telephone alert, an email alert, and/or any other type of alarm.” Ex. C at [0083].</p> <p>“In other examples, the energy profile utilizes different operational modes to optimize the energy use under certain conditions. For example, as illustrated in Table 7 above, the classrooms have an Occupied mode and an Unoccupied mode. When the lights are in Occupied mode, then the lights are on and when the lights are in Unoccupied mode, then the lights are off. The automatic and uniform</p>

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Claim 10	Rhee
	<p>application of the mode utilizing the energy profile advantageously enables the optimally regulation of energy consumption under particular conditions in order to minimize waist. <i>Table 8 illustrates different operational modes in the context of a HVAC unit. Although Table 8 illustrates the different operational modes in the context of a HVAC unit, the different operational modes can be utilized for any type of energy device. The operational modes can be utilized for any type of energy device to allow for the operation of the energy device.</i> For example, in the demand response mode, the energy profile for the lighting can be configured to turn off half of the lighting in a grocery store to conserve energy consumption. As another example, in optimal generation mode, the wireless controller controlling the energy producing devices (e.g., electrical grid power, wind generator, etc.) changes the input power to the system 100 based on the current sensor data that a cheaper energy producing device is available (in this example, change the energy producing device from electrical grid power to the wind generator).” <i>Id.</i> at [0097].</p>

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Claim 10

Rhee

TABLE 8

Exemplary Operations/Modes

Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy control	Energy profile control or local thermostat	Set per union range (e.g., ±3 degrees)	Schedule, occupancy sensors or exit of
Unoccupied	Empty	Local thermostat disabled	Disabled	Override mode
Override	Manual control	Local thermostat within energy profile	Wide comfort range (e.g., ±5 degrees)	Schedule or occupancy sensors
Maintenance	Manual control	Local thermostat with time lock	Maintenance control range (e.g., ±10 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optimal Generation Source Transition	Energy source availability HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Depends on generation source Not applicable	Energy source availability Schedule, outside temperature, weather forecast, and/or statistical data

FIG. 9 is a flowchart 900 illustrating management and monitoring of energy devices 460 and 462 by a wireless controller 410 utilizing an energy profile and sensor data as illustrated by FIG. 4. The network interface module 416 receives (910) energy profile modifications from the management server 120 of FIG. 1B and communicates the energy profile modifications to the control module 414. The control module 414 receives (920) sensor data from the temperature sensor 466 and the humidity sensor 468. The control module 414 manages (930) the energy devices (in this example, the air conditioning unit 460 and the humidifier de-humidifier unit 462) based on the energy profile and or the sensor data. The control module 414 receives (940) energy data from the energy devices 460 and 462 and sensor data from the sensors 466 and 468 and transmits (950) the energy data and the sensor data to the management sever 120 via the network interface module 416. The network interface

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Claim 10	Rhee
	<i>module 416 continues to receive (910) energy profile modifications from the management server 120.” Id. at [0102].</i>

12. Rhee discloses all elements of dependent claim 11 (which depends from claim 1).

Claim 11 requires that the “the network connection is based on the IEEE 802.11 wireless protocol.” Rhee discloses this limitation. Ex. G at ¶¶ 155-157.

As explained above in Section VI.B.2(c), Rhee disclosed the “one or more processors” receiving “a second data from a network connection” that “is received via the internet”. In describing how the described systems could be implemented, Rhee disclosed that “[t]he components of the system can be interconnected by” a “communication networks” may include a “802.11 network”. Ex. C at [0111]-[0112]. A POSITA would have recognized that a “802.11 network” refers to a network connection based on the IEEE 802.11 wireless protocol. Ex. G at ¶ 156.

* * *

Claim 11 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 11	Rhee
11. The system of claim 1:	<i>See supra</i> claim 1 claim chart.
[a] wherein the network connection is based on the	<i>See supra</i> claim 1 claim chart at element 1[d].

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Claim 11	Rhee
IEEE 802.11 wireless protocol.	<p><i>“The above described techniques can be implemented in a distributed computing system that includes a back-end component. The back-end component can, for example, be a data server, a middleware component, and/or an application server. The above described techniques can be implemented in a distributing computing system that includes a front-end component. The front-end component can, for example, be a client computer having a graphical user inter face, a Web browser through which a user can interact with an example implementation, and/or other graphical user inter faces for a transmitting device. The components of the system can be interconnected by any form or medium of digital data communication (e.g., a communication network).</i></p> <p>The system can include clients and servers. A client and a server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.</p> <p><i>Examples of communication networks include wired networks, wireless networks, packet-based networks, and/or circuit-based networks. Packet-based networks can include, for example, the Internet, a carrier internet protocol (IP) network (e.g., local area network (LAN), wide area network (WAN), campus area network (CAN), metropolitan area network (MAN), home area network (HAN)), a private IP network, an IP private branch exchange (IPBX), a wireless network (e.g., radio access network (RAN), 802.11 network, 802.16 network, general packet radio service (GPRS) network, HiperLAN), and/or other packet-based networks.</i></p>

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Claim 11	Rhee
	Circuit-based networks can include, for example, the public switched telephone network (PSTN), a private branch exchange (PBX), a wireless network (e.g., RAN, bluetooth, code-division multiple access (CDMA) network, time division multiple access (TDMA) network, global system for mobile communications (GSM) network), and/or other circuit-based networks.” Ex. C at [0110]-[0112].

13. Rhee disclosed all elements of dependent claim 12 (which depends from claim 1.

Claim 12 requires that the “determination of whether the building is occupied or unoccupied by [sic] is performed by the first processor”. Rhee disclosed this limitation. Ex. G at ¶¶ 158-161.

As explained above in Sections VI.B.2(a) and VI.B.2(i), Rhee disclosed a management server that was implemented was one or more computers containing one or more processors, any of which would be a “first processor”. As explained above in Sections VI.B.2(d), VI.B.3, and VI.B.4, the management server determined whether the building is occupied or unoccupied.

* * *

Claim 12 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 12	Rhee
12. The system of claim 1:	<i>See supra</i> claim 1 claim chart.

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Claim 12	Rhee
[a] wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.	<i>See supra</i> claim 1 claim chart at elements 1[pre]-[b], 1[e], 1[h], 1[j].

14. Rhee disclosed all elements of dependent claim 13 (which depends from claim 1).

Claim 13 requires that the “the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor”. Rhee disclosed this limitation. Ex. G at ¶¶ 163-166.

As explained above in Sections VI.B.2(a) and VI.B.2(i), Rhee disclosed a management server that was implemented as one or more computers containing one or more processors, any of which would be a “first processor”. As explained above in Sections VI.B.2(e) and VI.B.2(g), the management server controlled the HVAC system to provide heating or cooling to the building at an operational temperature.

* * *

Claim 13 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 13	Rhee
13. The system of claim 1:	<i>See supra</i> claim 1 claim chart.

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Claim 13	Rhee
[a] wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.	<i>See supra</i> claim 1 claim chart at elements 1[pre]-[b], 1[f], 1[h], and 1[i].

15. Rhee disclosed all elements of dependent claim 14 (which depends from claim 1).

Claim 14 requires that the “first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor”. Rhee disclosed this limitation. Ex. G at ¶¶ 168-170.

Rhee disclosed an energy management system comprising, among other things, “a wireless controller” and “a wireless sensor”. The disclosed wireless controller and wireless sensor are in communication with one another, and to other components of the system, including the management server, by way of a “wireless mesh network”. Ex. C at [0040]. A POSITA would have understood that sensor data communicated over this wireless mesh network was provided by a sensor that is “not electrically connected to the first processor”, because the wireless sensor was not physically connected to the management server. Ex. G at ¶ 169.

* * *

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Claim 14 was anticipated by and/or would have been obvious in view of
Rhee as shown in the following claim chart.

Claim 14	Rhee
14. The system of claim 1:	<i>See supra</i> claim 1 claim chart.
[a] wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.	<p>“Referring to FIG. 1A, an energy management system 50 is depicted. The energy management system 50 is associated with a building 51 or a series of buildings (e.g., a second building 51”, an office complex, a school campus, global offices, commonly-owned buildings, commonly-managed buildings, etc.). <i>The energy management system 50 includes the internet 52, a wireless gateway 53, a wireless repeater 54, a wireless controller A55a, a wireless controller B55b, a wireless actuator 57, a wireless sensor 58, and energy devices 59. The building 51 includes a plurality of rooms (e.g., room A 56a and room B 56b). The energy management system 50 is interconnected via a wireless mesh network. The wireless gateway 53 connects the wireless mesh network with a management server (not shown) via the internet 52. The wireless repeater 54 extends the range of the wireless mesh network by forwarding and/or routing communications between the wireless controllers 55a and 55b, the wireless sensor 58 and/or the wireless actuator 57. The wireless controllers A55a and B 55b are associated with the rooms A 56a and B 56b, respectfully. The wireless actuator 57 actuates and/or deactuates energy devices and/or any other type of device (e.g., mechanical device, electrical device, etc.). The wireless sensor 58 provide energy data to the wireless controllers A 55a and B 55b and/or the management server.”</i> Ex. C at [0040].</p> <p><i>“In some embodiments, the wireless controllers A 55a and B 55b can communicate with each other</i></p>

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Claim 14	Rhee
	<i>via the wireless mesh network. For example, the wireless sensor 58 transmits temperature data to the wireless controller A 55a via wireless controller B 55b and the wireless mesh network. In other words, the wireless sensor 58 transmits the temperature data to the wireless controller A 55a via the wireless mesh network through the following devices: the wireless sensor 58, a first wireless repeater, wireless controller B 55b, a second wireless repeater, a third wireless repeater, and then the wireless controller A 55a.” Id. at [0042].</i>

16. Rhee disclosed all elements of claim 15 (which depends from claims 1 and 7).

Claim 15 requires that the “interface is configured to allow the user to turn the HVAC system on or off”. Rhee disclosed this limitation. Ex. G at ¶¶ 171-174.

As explained above in Sections VI.B.2(d)-(g), Rhee disclosed that the management server could receive commands from the client module. Rhee disclosed that, using the client module, the user could “control the system”, including by modifying temperature setpoints and schedules. Ex. C at [0056]. Rhee also disclosed that the temperature setpoints determined whether the HVAC system was “on” or “off”. *Id.* at [0085]-[0086]. A POSITA would have appreciated that the user could turn the HVAC system on or off at least by adjusting the temperature setpoints using the interface of the client module. Ex. G at ¶ 173. It would also have been obvious that Rhee disclosed an interface

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configured to allow the user to turn the HVAC system on or off. *See id.* Rhee disclosed that a “wireless controller 510” provided “thermostat functions”, which as understood by a POSITA would conventionally have included an on/off functionality. Ex. C at [0085]. Rhee also disclosed that “existing thermostat devices” could be utilized. *Id.* A POSITA would have known that such “existing thermostat devices” conventionally included on/off functionality. Ex. G at ¶ 173.

* * *

Claim 15 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 15	Rhee
15. The system of claim 7: [a] wherein the interface is configured to allow the user to turn the HVAC system on or off.	<p><i>See supra</i> claim 1 claim chart; claim 7 claim chart.</p> <p><i>See supra</i> claim 1 claim chart at 1[pre], 1[f], 1[h], 1[j].</p> <p><i>“FIG. 5 shows an example of a wireless controller 510 providing thermostat functions. The wireless controller 510 includes a display device 512, a temperature user control 517a, a humidity user control 517b, a setting user control 517c, and an override user control 517d. A user can adjust the temperature and humidity levels of the room serviced by wireless controller 510 via the temperature user control 517a and the humidity user control 517b, respectively, within the limits of all or part of the energy profile. The user can override the settings as defined by the energy profile by utilizing the override user control 517d. The override user control 517d can be used to temporarily (e.g., sixty minutes, one day, etc.) override the mode settings. The user can also save</i></p>

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Claim 15	Rhee
	the updated setting and/or request that the updated setting be saved by utilizing the setting user control 517c. An advantage of utilizing the user controls is that the energy management system 100 is easy to use and is similar to existing user controls for energy systems and thus more efficient to use and learn by the user (i.e., better user compliance for energy management). <i>It should be noted that existing thermostat devices can be utilized in conjunction with the wireless controller 510 to reduce the cost of retrofitting the energy management system 500.</i> ” Ex. C at [0085].

17. Rhee disclosed all elements of claim 16 (which depends from claims 1 and 7).

Claim 16 required that the “interface is configured to allow the user to input that the building is currently unoccupied”. Rhee disclosed this limitation. Ex. G at ¶¶ 179-185.

As explained above in Sections VI.B.2(d)-(g), Rhee disclosed that the management server could receive commands from the client module. Rhee disclosed that, using the client module, the user could “control the system”, including by modifying temperature setpoints and schedules. Ex. C at [0056]. Rhee also disclosed that unoccupancy can be triggered by the schedule. *Id.* at Table 8. Therefore a user could modify the scheduled start of “unoccupied” mode to the current time, and thereby change the current mode to “unoccupied”.

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It would have been understood by a POSITA that being able to modify schedules meant that the client module was configured to allow the user to input that the building is currently unoccupied. Moreover, it would have been obvious to a POSITA that the ability to “control” the system entailed being able to input that the building is currently unoccupied. Ex. G at ¶ 182.

Additionally, Rhee disclosed that the user can override the settings as defined by the energy profile by utilizing the override user control. Ex. C at [0085]. This override user control could be used to temporarily override mode settings. *Id.* And as explained above, “occupied” and “unoccupied” were each “modes” in the energy profile. *See id.* at Table 8. This override feature thus allowed users to input that the building is currently unoccupied. Ex. G at ¶¶ 183-84.

* * *

Claim 16 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 16	Rhee
16. The system of claim 7:	<i>See supra</i> claim 1 claim chart; claim 7 claim chart.
[a] wherein the interface is configured to allow the user to input that the building is currently unoccupied.	<i>See supra</i> claim 1 claim chart at 1[pre], 1[f], 1[h], 1[j]. “FIG. 5 shows an example of a wireless controller 510 providing thermostat functions. The wireless controller 510 includes a display device 512, a temperature user control 517a, a humidity user

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Claim 16	Rhee
	<p>control 517b, a setting user control 517c, and an override user control 517d. A user can adjust the temperature and humidity levels of the room serviced by wireless controller 510 via the temperature user control 517a and the humidity user control 517b, respectively, within the limits of all or part of the energy profile. <i>The user can override the settings as defined by the energy profile by utilizing the override user control 517d. The override user control 517d can be used to temporarily (e.g., sixty minutes, one day, etc.) override the mode settings. The user can also save the updated setting and or request that the updated setting be saved by utilizing the setting user control 517c.</i> An advantage of utilizing the user controls is that the energy management system 100 is easy to use and is similar to existing user controls for energy systems and thus more efficient to use and learn by the user (i.e., better user compliance for energy management). It should be noted that existing thermostat devices can be utilized in conjunction with the wireless controller 510 to reduce the cost of retrofitting the energy management system 500.” Ex. C at [0085].</p>

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Claim 16

Rhee

TABLE 8

Extensary Operational Modes				
Mode	Description	Temperature	Range	Trigger
Occupied	Full occupancy	Energy profile control or local thermostat	Set per comfort range (e.g., ±3 degrees)	Schedule, occupancy sensors or exit of
Unoccupied	Empty	Local thermostat disabled	Disable 1	Override mode
Override	Manual control	Local thermostat within energy profile	Wider comfort range (e.g., ±5 degrees)	Schedule or occupancy sensors
Maintenance	Manual control	Local thermostat with time limit	Maintenance control range (e.g., ±10 degrees)	Override button
Demand Response	Full occupancy during peak energy consumption	Energy profile control	Disabled	Energy requirements from the electrical grid
Optimal Generation Source	Energy source availability	Energy profile control	Depends on generation source	Energy source availability
Transition	HVAC transition from heating to cooling, etc.	Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or statistical data

“In other examples, the client module 150 includes a web-based interface utilized to manage the management server 120 and or the wireless controllers 110 via the network 140. A user and or an administrator can, for example, access the client module 150 utilizing a transmitting device (e.g., laptop computer with a web browser) and remotely control the system 100. The user and or the administrator can remotely control the system 100 by directly communicating with the wireless controls 110 or by communicating with the management server 120. The client module 150 can control access via various granular levels of access utilizing a user name/password and/or any other type of authentication/authorization mechanism. For example, the user utilizing the client module 150 via the transmitting device can monitor current energy consumption conditions and the wireless mesh network 170 status. The user can also view historical trending charts and analysis reports

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Claim 16	Rhee
	created by the management server 120. <i>As another example, the user, depending on their access level, can modify the energy profile (e.g., modify temperature set points for the modes and the schedules).</i> Although FIG. 1B illustrates the client module 150 separate from the management server 120, the client module 150 can be integrated into the management server 120.” <i>Id.</i> at [0056].

18. Rhee disclosed the dependent limitations of claim 18 (which depends from claim 17).

Claim 18 requires that the “first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor”. As discussed above in regard to claim 14, Rhee disclosed this limitation. Ex. G at ¶¶ 206-208.

Rhee disclosed an energy management system comprising, among other things, “a wireless controller” and “a wireless sensor”. The disclosed wireless controller and wireless sensor are connected to one another, and to other components of the system, including the management server which included a “first processor”, by way of a “wireless mesh network”. Ex. C at [0040]. A POSITA would have thus understood that sensor data provided over this wireless mesh network would have been provided by a sensor that is “not electrically connected to the first processor”. Ex. G at ¶ 207.

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Claim 18 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 18	Rhee
18. The system of claim 17	<i>See supra</i> claim 17 claim chart.
[a] wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.	<i>See supra</i> claim 14 claim chart at element 14[a].

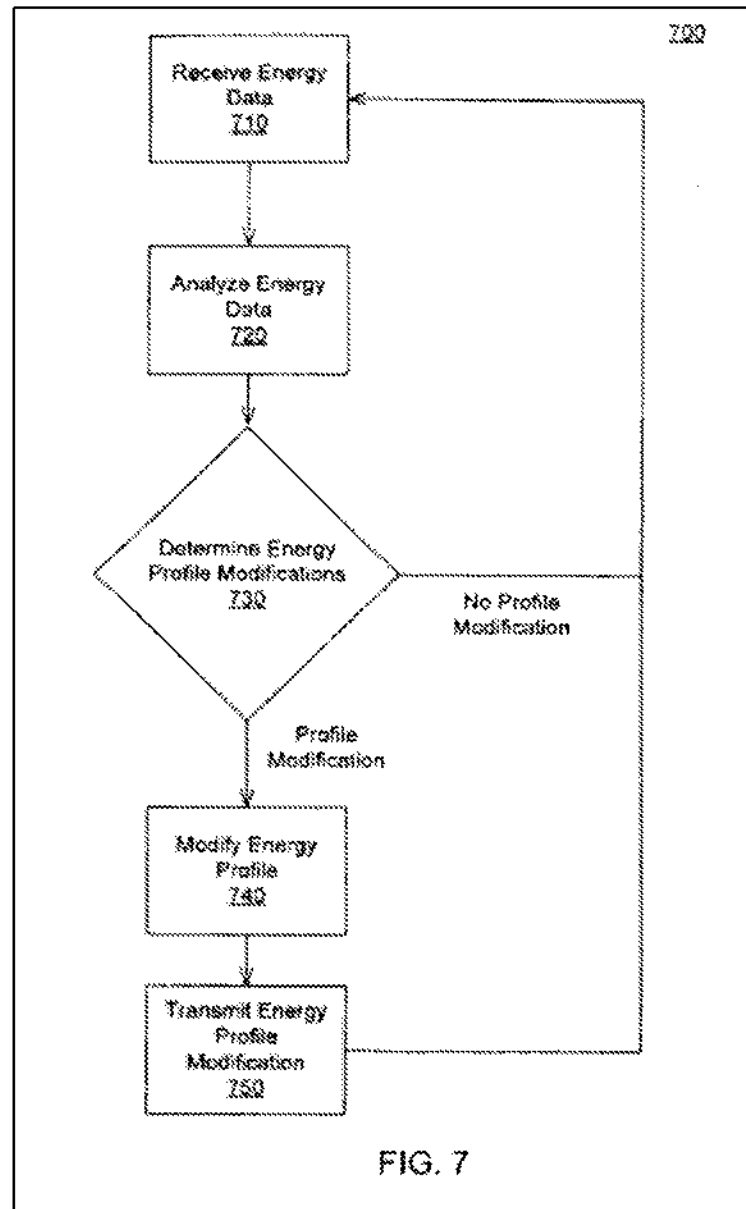
19. Rhee disclosed all elements of dependent claim 19 (which depends from claim 1) and dependent claim 20 (which depends from claim 17).

Claims 19 and 20 require the one or more processors to control “the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data”. Rhee disclosed this limitation. Ex. G at ¶¶ 209-215.

Rhee disclosed a system that included an “analysis module” which could access “energy data” stored on the storage module in order to create charts and reports regarding past, present or future energy usage. Ex. C at [0066]. The analysis module was capable of integrating information like the temperature outside the building and the temperature inside a room, then using the information to devise a modification to the energy profile. *Id.* at [0067]. When the analysis

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module concluded that a modification was in order, the “profile module” modified the energy profile and transmitted the modified profile to the wireless controllers, which effectuated the profile. *Id.* at [0098]-[0099]. Figure 7, reproduced below, illustrates the process by which the energy profile was adjusted:



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The “energy data”, described in Figure 7, could include “environmental data”. *Id.* at [0066]. Environmental data, in turn, could include measurements of “outside temperature” and “inside temperature” (among others). *Id.* at [0057]. Thus, Rhee disclosed controlling an HVAC system using energy profiles with operational temperatures based on at least in part historical values. Alternatively, it would have been obvious that Rhee disclosed a system wherein one or more processors controlled the HVAC system to provide heating or cooling a building to an operational temperature based on historical values of inside and outside temperature. Ex. G at ¶ 211.

* * *

Claim 19 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 19	Rhee
19. The system of claim 1	<i>See supra</i> claim 1 claim chart.
[a] wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.	“In some examples, <i>the analysis module 226 accesses energy data (e.g., current energy consumption data, past energy consumption data, environmental data, etc.) stored on the storage module 228 to create charts and or reports regarding past, present, and or future energy use for the system 200.</i> The charts and/or reports can include, for example, a future energy savings chart/report (e.g., how much will be saved by the energy management system 200, how much can be saved by switching from a HVAC unit to another HVAC unit, etc.), a present energy chart/report (e.g., present use of alternative energy generation,

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Claim 19	Rhee
	<p>present energy use of lights, etc.), a past energy chart/report (e.g., past use of alternative energy generation, past energy use of HVAC units, past indoor and outdoor temperatures, etc.) and/or any other type of chart/report associated with the energy management system 200 (e.g., use of energy by a type of energy device at one building compares to the use of energy of the same energy device at other buildings, energy devices operating at or below optimal efficiency, etc.).” Ex. C at [0066].</p> <p>“For example, the analysis module 226 creates a energy report for the current inputted by the HVAC unit versus the average temperature outside of the building as recorded by a temperature sensor over the course of the past ten years. As another example, the analysis module 226 creates a time chart for the time between when the Occupied mode is activated until when individual rooms in a zone (e.g., all of the classrooms in a building) reach the set temperature. <i>The time chart can be utilized by the analysis module 226 to modify the energy profile</i> and/or can be utilized by the administrator to determine if the energy unit (e.g., HVAC unit) is underperforming, requires maintenance, and/or if any other issues exist for the rooms. As another example, the analysis module 226 creates a energy savings report based on past indoor and outdoor temperatures. The energy savings report can include, for example, the energy saved by the energy management system 200 (e.g., 15% of heating energy was saved due to the energy management system 200 during the last two months; 25% of cooling energy was saved last quarter by optimized temperature ranges, etc.).” <i>Id.</i> at [0067].</p>

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Claim 19	Rhee
	<p>“FIG. 7 is a flowchart 700 illustrating management of wireless controllers 210 by a management server 220 utilizing an energy profile and energy data as illustrated by FIG. 2. The communication module 222 of the management server 220 receives (710) energy data from the wireless controller 210 via the wireless mesh network 270, the wireless gateway 130, and the network 140. <i>The analysis module 226 analyzes (720) the energy data and determines (730) if any modifications are needed for the energy profile.</i> If energy profile modifications are not needed, then the communication module 222 continues receiving (710) energy data from the wireless controller 210.” <i>Id.</i> at [0098].</p> <p>“<i>If energy profile modifications are needed, then the analysis module 226 communicates the modifications to the profile module 224. The profile module 224 modifies (740) the energy profile based on the modifications to the energy profile and or other parameters (e.g., weather information, user preferences, building preferences, etc.). The profile module 224 transmits (750) the modified energy profile to the wireless controller 210 and the communication module 222 continues to receive (710) energy data.</i>” <i>Id.</i> at [0099].</p> <p>“In other examples, <i>the storage module 228 stores the energy data, the modifications to the energy profile, and/or the energy profile utilizing a database. For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. The database can be, for example, accessed by the client module 150 and/or the management server 220. In other embodiments, the storage module 228 can be located remotely from the management server 220.</i>” <i>Id.</i> at [0070].</p>

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Claim 19	Rhee
	<p>“In some examples, the <i>energy data includes</i> energy consumption data, <i>environmental data</i>, energy generation data, and/or any other type of data associated with building management (e.g., direction of windows on the building, prevailing wind, insulation type, oil tank level, propane tank level, alert information, etc.). The energy consumption data can include, for example, energy used by the energy device 160, energy saved by the energy device 160, further energy use by the energy device 160, proposed energy use by the energy device 160, cost of different types of energy, and/or any other type of data associated with the consumption of energy. <i>The environmental data can include, for example, outside temperature, inside temperature, outside humidity, inside humidity, rainfall, sunlight coverage, environmental costs of different types of energy (e.g., cost of one kilowatt of wind power, greenhouse gas emissions for one kilowatt of coal power, etc.), and/or any other data associated with the environment. The energy generation data can include, for example, alternative energy generation level (e.g., solar power generation, wind power generation, etc.), grid power level, and/or any other type of data associated with energy generation.</i>” <i>Id.</i> at [0057].</p>

* * *

Claim 20 was anticipated by and/or would have been obvious in view of Rhee as shown in the following claim chart.

Claim 20	Rhee
20. The system of claim 17	<i>See supra</i> claim 17 claim chart.

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Claim 20	Rhee
[a] wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.	<i>See supra</i> claim 19 claim chart at element 19[a].

C. SNQP 2: Claims 7-9 and 15-16 are rendered obvious by Rhee in view of Sullivan.

SNQP 2 presents an additional ground of invalidity with respect to claims 7-9 and 15-16. To the extent Rhee is found not to disclose any of the dependent claim limitations of these claims, the limitations were disclosed by Sullivan. It would have been obvious to incorporate Sullivan's teachings as set forth below.

1. Overview of Sullivan.

Sullivan is directed to a remote control system for an HVAC system, which uses a web-based interface. Ex. E at 1:40-45. Sullivan taught a Building Control Appliance ("BCA"), which was analogous to Rhee's management server, that controlled one or more HVAC systems in a building, and enabled users to remotely control the systems through a web-based user interface accessible over the Internet. *See infra*. Sullivan disclosed that the BCA was in communication with Thermostats, which were analogous to Rhee's wireless controllers.

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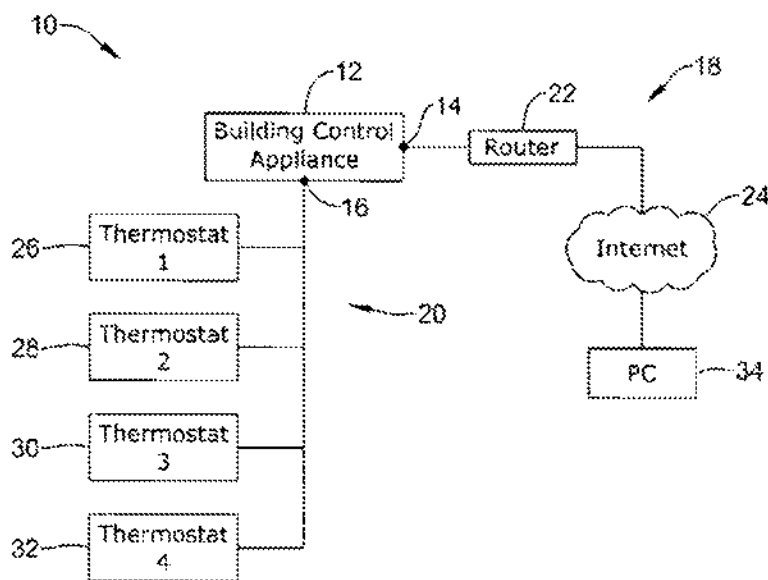


Figure 1

2. Sullivan disclosed the dependent limitations of claim 7 (which depends from claim 1).

Claim 7 requires that the “one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.” Sullivan disclosed this limitation. Ex. G at ¶¶ 133-134.

Sullivan disclosed that the BCA received at least one setting of an HVAC system. In particular, Sullivan expressly disclosed that the system displayed to the user HVAC settings including “a current operating mode of HVAC equipment”, “a lockout status of HVAC equipment” and “a fan switch status of HVAC

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equipment”. Ex. E at 5:19-6:7 & Fig. 3C. These were displayed to the user on a web page.

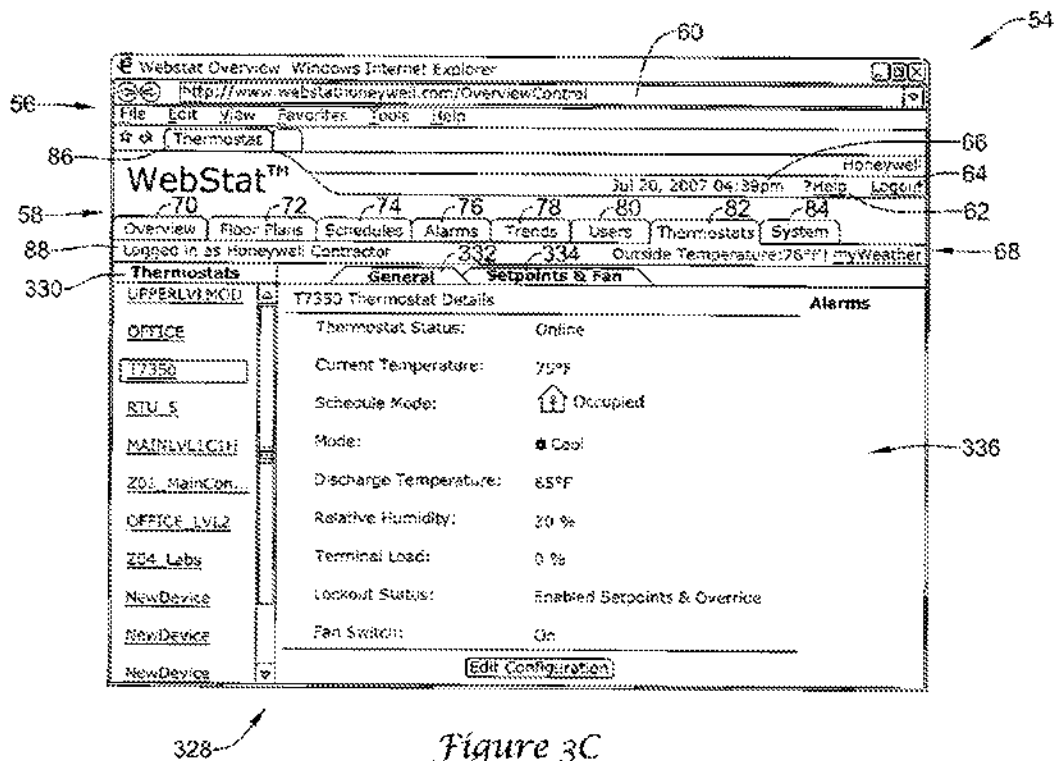


Figure 3C

A POSITA would appreciate that the current values of these HVAC settings were reported to the BCA directly or indirectly from an HVAC system, as Sullivan disclosed (*id.* at 7:16-23), and thus were received by the processors in the BCA. Ex. G at ¶ 134. Additionally, the BCA could receive HVAC settings transmitted by the user. Ex. E at 12:4-17. For example, the user could change the operating mode of the HVAC system and the fan switch, as shown below. *Id.* at 11:61-12:17.

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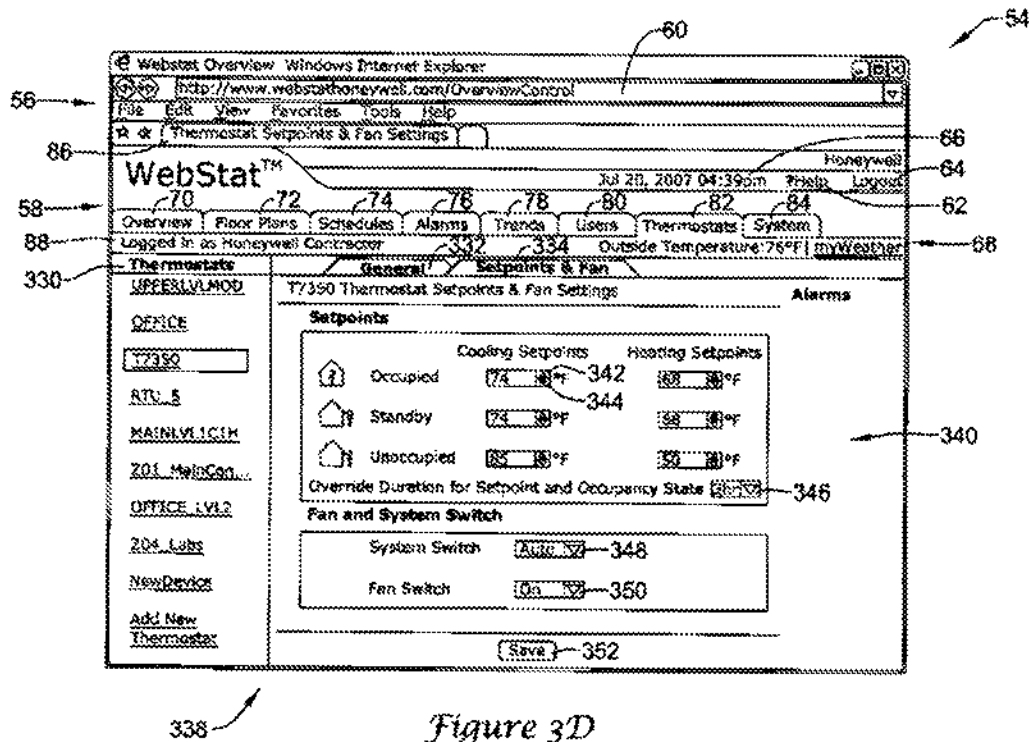


Figure 3D

It would have been obvious to modify Rhee to incorporate Sullivan's teachings of allowing users to view and modify settings of an HVAC system, including the HVAC operating mode, given Rhee's teachings of the use of a remote web interface for control of an HVAC system. Ex. G at ¶ 134. A POSITA would understand that the processors of the web server receive the settings in order to display them to the user, and in order to allow the user to change them. *Id.*

* * *

Claim 7 would have been obvious in view of Rhee in combination with Sullivan as shown in the following claim chart.

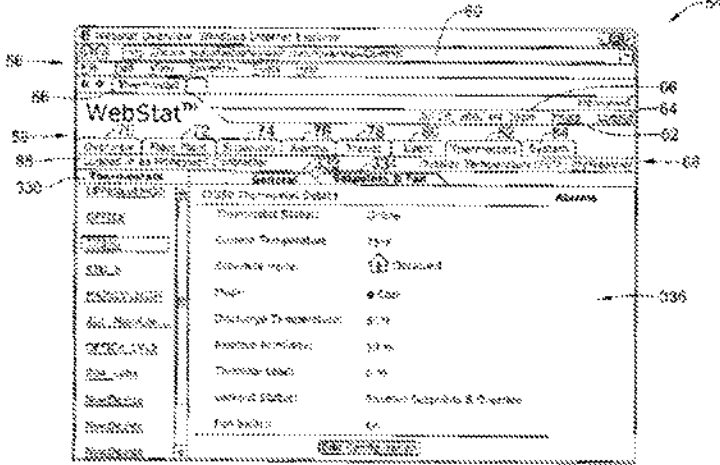
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Claim 7	Rhee and Sullivan
7. The system of claim 1:	<i>See supra</i> SNQP 1 claim 1 claim chart.
[a] wherein the one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.	<p><i>See supra</i> SNQP 1 claim 7[a] claim chart.</p> <p>“Controller 36 may maintain monitoring information, status information, set point information, alarming information, trending information and/or configuration information, and the user rights privileges control, at least in part, what information can be or is displayed and/or changed via web server 38.” Ex. E at 7:10-15.</p> <p>“In some cases, building control appliance 12 may be adapted to be coupled, either directly or indirectly, to an HVAC system, and web server 38 may be adapted to provide one or more web pages via first port 14 that allow information related to the HVAC system to be assigned and unassigned to the user rights privileges. In some cases, at least some of the users of building control appliance 12 are assigned user rights privileges.” <i>Id.</i> at 7:16-23.</p> <p><i>“A variety of information may be displayed on the summary web page. Examples of information include but are not limited to one or more of a thermostat identifier for one or more of the thermostats, a current inside temperature reported by one or more of the thermostats, a current outside temperature, a current set point for one or more of the thermostats, a schedule related parameter for one or more of the thermostats, a humidity related parameter that is reported by one or more of the thermostats, a current operating mode of HVAC equipment that is connected to one or more of the thermostats, an alarm related parameter for one or more of the thermostats, a discharge air temperature of HVAC equipment that is connected to one or more of the thermostats, a plenum related</i></p>

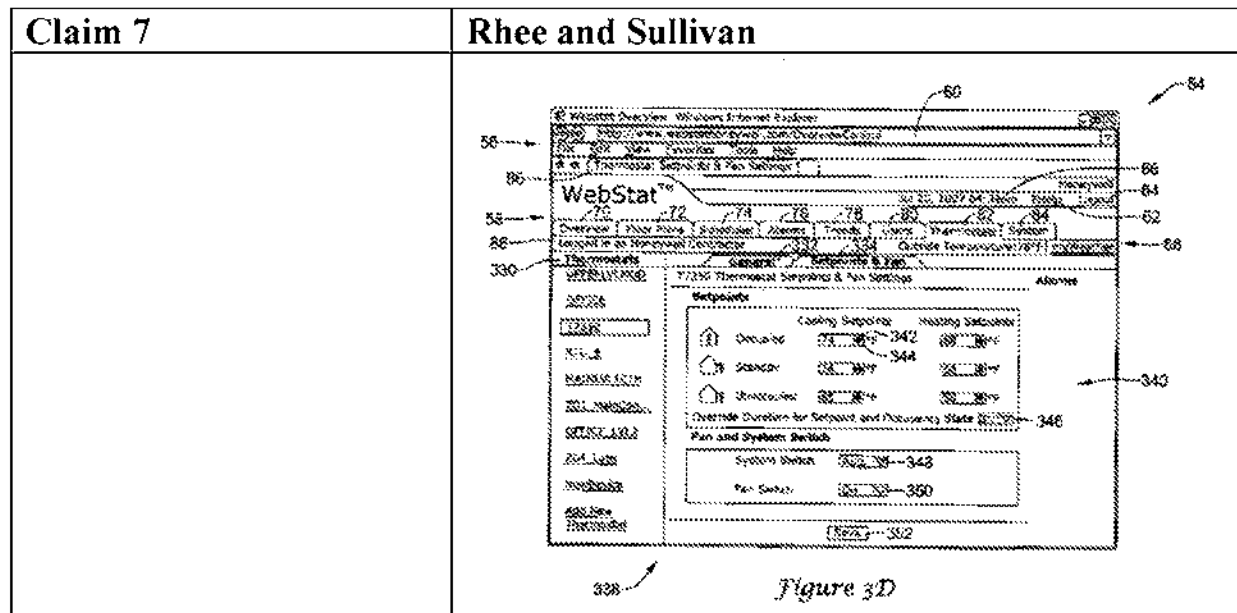
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Claim 7	Rhee and Sullivan
	<p>pressure of HVAC equipment that is connected to one or more of the thermostats, <i>a relay output related parameter of HVAC equipment that is connected to one or more of the thermostats, a lockout status of HVAC equipment that is connected to one or more of the thermostats; a fan switch status of HVAC equipment that is connected to one or more of the thermostats, a throttle range of HVAC equipment that is connected to one or more of the thermostats, an integral time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, a derivative time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, and an anticipator authority of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats. These are only examples, and it is contemplated that any suitable information may be included on the summary web page, as desired.</i>” <i>Id.</i> at 5:35-64.</p> <p>“In FIG. 3D, it can be seen that web page 338 includes a pane 340 that includes information regarding setpoint and fan information for thermostat 316 (T7350). In particular, pane 340 displays cooling and heating temperature set points for one or more time periods such as occupied, unoccupied and standby. For example, pane 340 includes an up arrow 342 and a down arrow 344 that may be used to alter the cooling set point temperature during the occupied time period. Pane 340 includes a pull-down menu 346 that may be used to alter a schedule override duration. Pane 340 also includes settings pertaining to a fan switch and a system switch. <i>In particular, pane 340 includes a pull-down menu 348 that may be used to alter a setting such as Auto, cool, heat</i></p>

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Claim 7	Rhee and Sullivan
	<p>and the like for the system switch as well as a pull-down menu 350 that may be used to set the fan switch to either On or Auto. A Save button 352 permits a user to save any changes that they have made to the parameters displayed within web page 352. In some instances, the Save button 352 may be omitted, and web server 38 (FIG. 2) may ask a user if changes should be saved if any parameter values or settings were altered and if the user attempts to exit a particular web page by, for example, selecting another tab within navigation bar 58. Alternatively, the changes may automatically be saved.” <i>Id.</i> at 11:61-12:17.</p>  <p style="text-align: center;">Figure 3C</p>

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3. Sullivan disclosed the dependent limitations of claim 8 (which depends from claims 1 and 7).

Claim 8 requires that the “the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.” Sullivan disclosed this limitation. Ex. G at ¶¶ 139-141.

As explained above in Section VI.C.2 Sullivan disclosed that the BCA received whether the HVAC system is currently on or off. For example, Figure 3C shows the web summary screen indicating the mode of HVAC system is currently “❄️ Cool” which is a setting showing the HVAC system is on.

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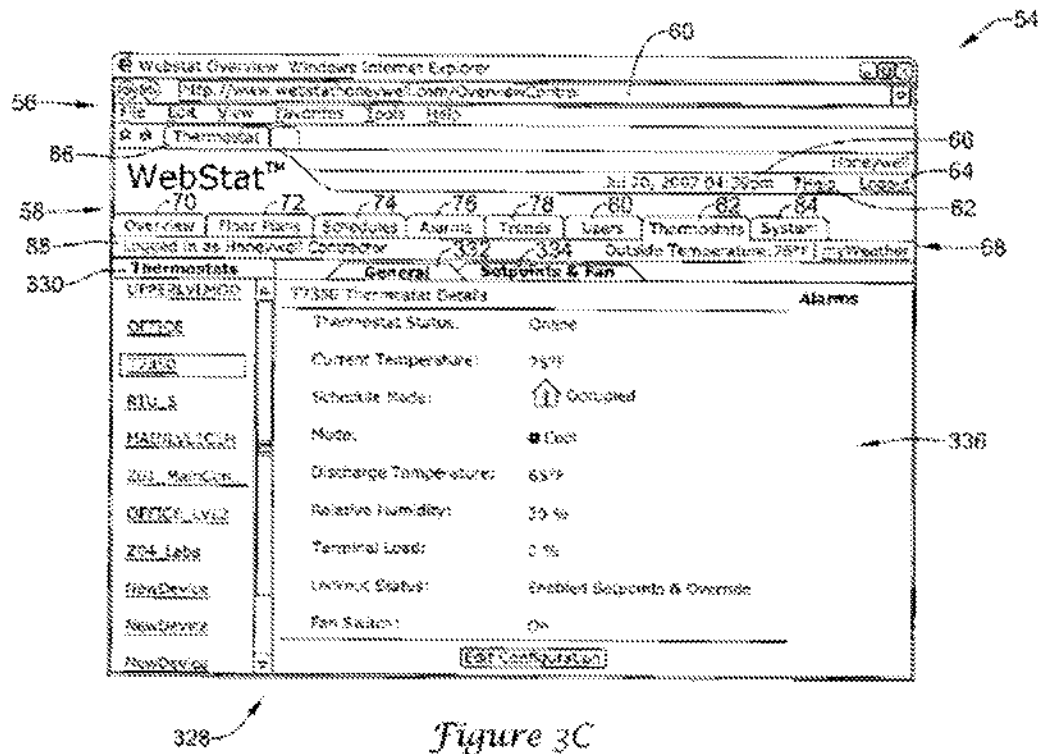


Figure 3C

Figure 9B shows the same web page indicating the mode of the HVAC system is currently “Off”.

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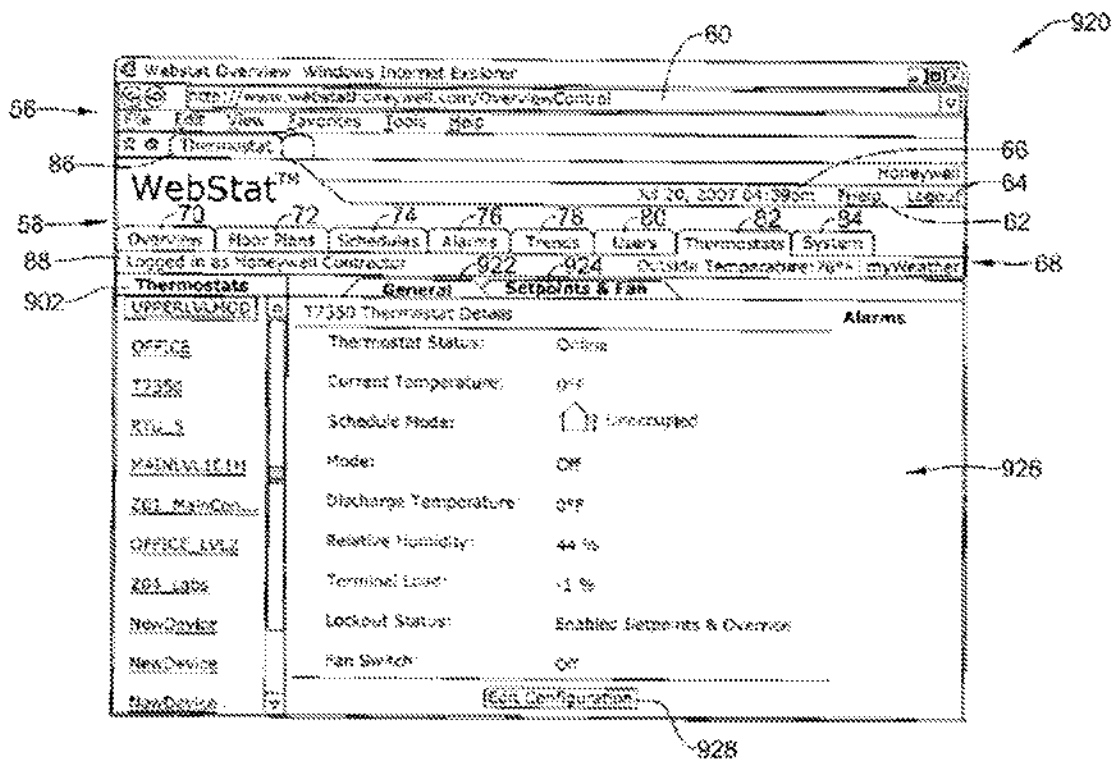


Figure 9B

Figure 3D shows a pull-down menu 348 that serves as a “system switch” to alter a setting such as “[a]uto, cool, heat, and the like”. Ex. E at 12:4-11. Auto, cool and heat are modes in which the HVAC system is “on”. As shown in Figures 3C and 9B, the mode settings also included “off”. Thus, a POSITA would have appreciated that Sullivan disclosed a system that received an HVAC setting of “on” or “off”. Ex. G at ¶ 140.

It would have been obvious to modify Rhee to incorporate Sullivan’s teachings of allowing users to view and modify the on/off setting of an HVAC system, given Rhee’s teachings of the use of a remote web interface for control of an HVAC system. *Id.* at ¶ 141. A POSITA would understand that the processors

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of the web server would receive a setting indicating whether the HVAC system was on or off, in order to display the setting to the user and to allow the user to change the setting. *Id.*

* * *

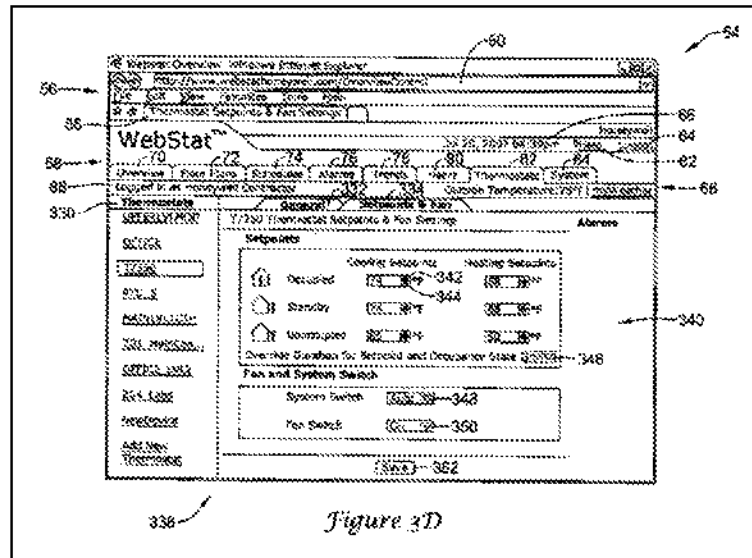
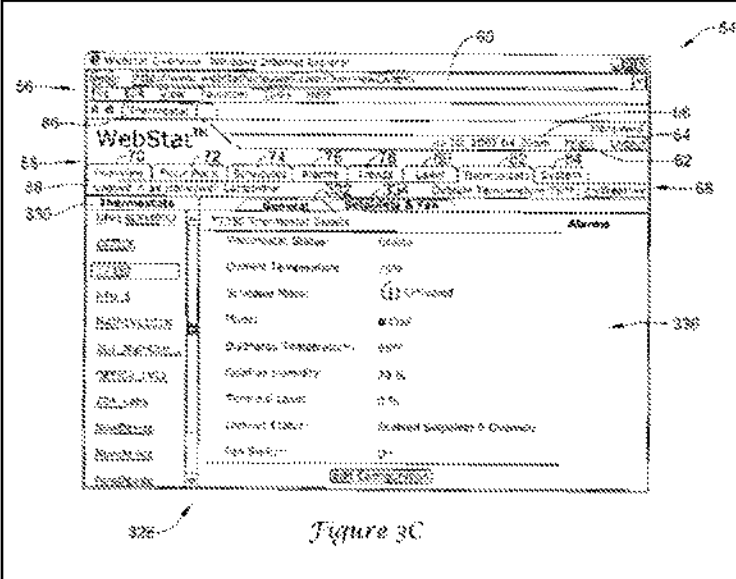
Claim 8 would have been obvious in view of Rhee in combination with Sullivan as shown in the following claim chart.

Claim 8	Rhee and Sullivan
8. The system of claim 7:	<i>See supra</i> SNQP 1 claim 1 claim chart; SNQP 2 claim 7 claim chart .
[a] wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.	<p><i>See supra</i> SNQP 2 claim 7 claim chart at element 7[a].</p> <p>“Pane 340 also includes settings pertaining to a fan Switch and a system switch. In particular, pane 340 includes a pull-down menu 348 that may be used to alter a setting such as Auto, cool, heat and the like for the system switch as well as a pull-down menu 350 that may be used to set the fan switch to either On or Auto. A Save button 352 permits a user to save any changes that they have made to the parameters displayed within web page 352. In some instances, the Save button 352 may be omitted, and web server 38 (FIG. 2) may ask a user if changes should be saved if any parameter values or settings were altered and if the user attempts to exit a particular web page by, for example, selecting another tab within navigation bar 58. Alternatively, the changes may automatically be saved.”</p> <p>Ex. E at 12:4-17; <i>see also id.</i> at Figs. 3C, 3D, 9B.</p>

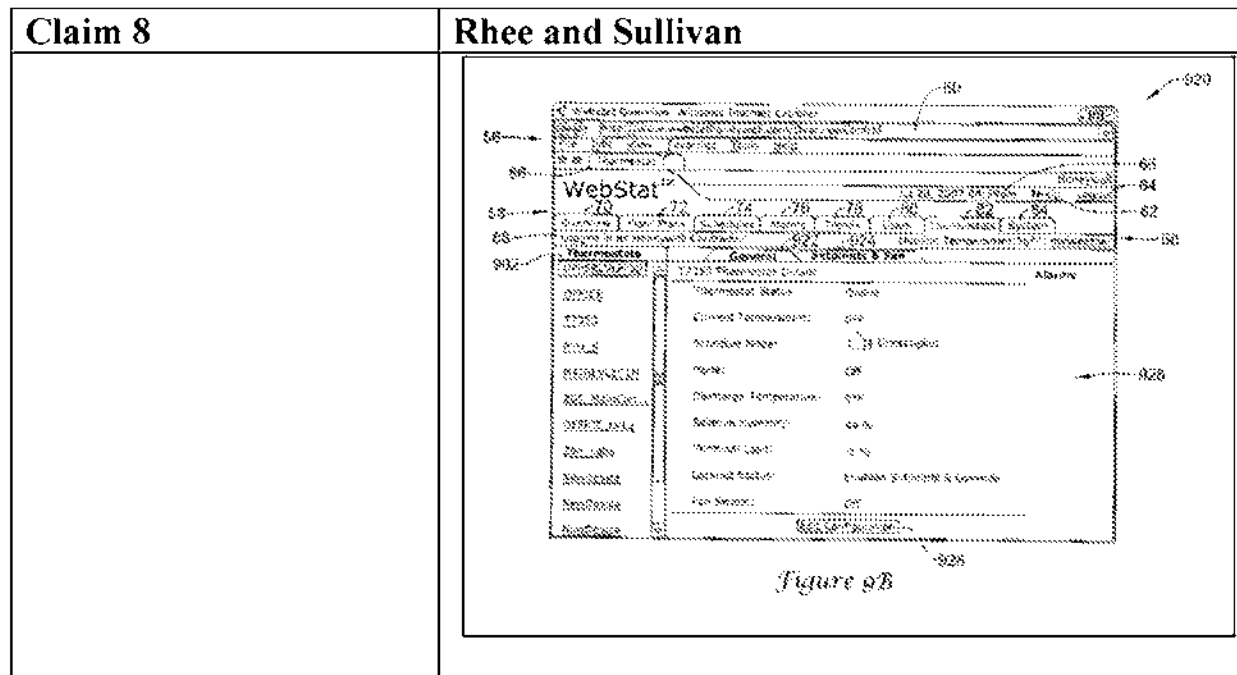
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Claim 8

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4. Sullivan disclosed all elements of dependent claim 9 (which depends from claims 1 and 7).

Claim 9 requires that the “the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.” Sullivan disclosed this limitation. Ex. G at ¶¶ 146-148.

As explained above in Section VI.C.2-3, Sullivan displayed the mode of the HVAC system which, as a POSITA would appreciate would indicate if the HVAC system was currently operating in a cooling mode or a heating mode: “Setpoints column 306 may include one or more icons for each thermostat, indicating the operational status of corresponding HVAC equipment. For example, a snowflake icon may be displayed if air conditioning equipment is operating, or perhaps a

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flame icon may be displayed if heating equipment is operating.” Ex. E at 10:50-59;
Ex. G at ¶ 147-48.

It would have been obvious to modify Rhee to incorporate Sullivan’s teachings of allowing users to view and modify the cooling/heating setting of an HVAC system, given Rhee’s teachings of the use of a remote web interface for control of an HVAC system. Ex. G at ¶ 148. A POSITA would understand that the processors of the web server would receive a setting indicating whether the HVAC system was in heating or cooling mode, in order to display the setting to the user and to allow the user to change the setting. *Id.*

* * *

Claim 9 would have been obvious in view of Rhee in combination with Sullivan as shown in the following claim chart.

Claim 9	Rhee and Sullivan
9. The system of claim 7:	<i>See supra</i> SNQP 1 claim 1 claim chart; SNQP 2 claim 7 claim chart.
[a] wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.	<i>See supra</i> SNQP 2 claim 8 claim chart at element 8[a]. “Setpoints column 306 may provide a columnar list of current temperature set points as well as equipment status for each of the corresponding thermostats within Thermostat column 302. If the HVAC equipment controlled by a particular thermostat is operating, <i>Setpoints column 306 may include one or more icons for each thermostat, indicating the operational status of corresponding HVAC equipment. For example, a snowflake icon</i>

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Claim 9	Rhee and Sullivan
	<p><i>may be displayed if air conditioning equipment is operating, or perhaps a flame icon may be displayed if heating equipment is operating.”</i> Ex. E at 10:50-59.</p> <p>“A variety of information may be displayed on the summary web page. Examples of information include but are not limited to one or more of a thermostat identifier for one or more of the thermostats, a current inside temperature reported by one or more of the thermostats, a current outside temperature, a current set point for one or more of the thermostats, a schedule related parameter for one or more of the thermostats, a humidity related parameter that is reported by one or more of the thermostats, <i>a current operating mode of HVAC equipment that is connected to one or more of the thermostats</i>, an alarm related parameter for one or more of the thermostats, a discharge air temperature of HVAC equipment that is connected to one or more of the thermostats, a plenum related pressure of HVAC equipment that is connected to one or more of the thermostats, a relay output related parameter of HVAC equipment that is connected to one or more of the thermostats, a lockout status of HVAC equipment that is connected to one or more of the thermostats; a fan switch status of HVAC equipment that is connected to one or more of the thermostats, a throttle range of HVAC equipment that is connected to one or more of the thermostats, an integral time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, a derivative time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, and an anticipator authority of the control algorithm used to control the HVAC equipment that is</p>

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Claim 9	Rhee and Sullivan
	<p>connected to one or more of the thermostats. These are only examples, and it is contemplated that any suitable information may be included on the summary web page, as desired.” <i>Id.</i> at 5:35-64.</p> <p>“Pane 340 also includes settings pertaining to a fan Switch and a system switch. In particular, pane 340 includes a pull-down menu 348 that may be used to alter a setting such as Auto, cool, heat and the like for the system switch as well as a pull-down menu 350 that may be used to set the fan switch to either On or Auto. A Save button 352 permits a user to save any changes that they have made to the parameters displayed within web page 352. In some instances, the Save button 352 may be omitted, and web server 38 (FIG. 2) may ask a user if changes should be saved if any parameter values or settings were altered and if the user attempts to exit a particular web page by, for example, selecting another tab within navigation bar 58. Alternatively, the changes may automatically be saved.” <i>Id.</i> at 12:4-17; <i>see also id.</i> at Figs. 3C, 3D, 9B.</p>

5. Sullivan disclosed all elements of claim 15 (which depends from claims 1 and 7).

Claim 15 requires that the “interface is configured to allow the user to turn the HVAC system on or off”. Sullivan disclosed this limitation. Ex. G at ¶¶ 175-178.

As with the management server in Rhee, Sullivan disclosed that the BCA could send commands to control an HVAC system. In particular, a user could

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cause the BCA to alter the mode of an HVAC system (which controlled whether it was off or on) via a web page:

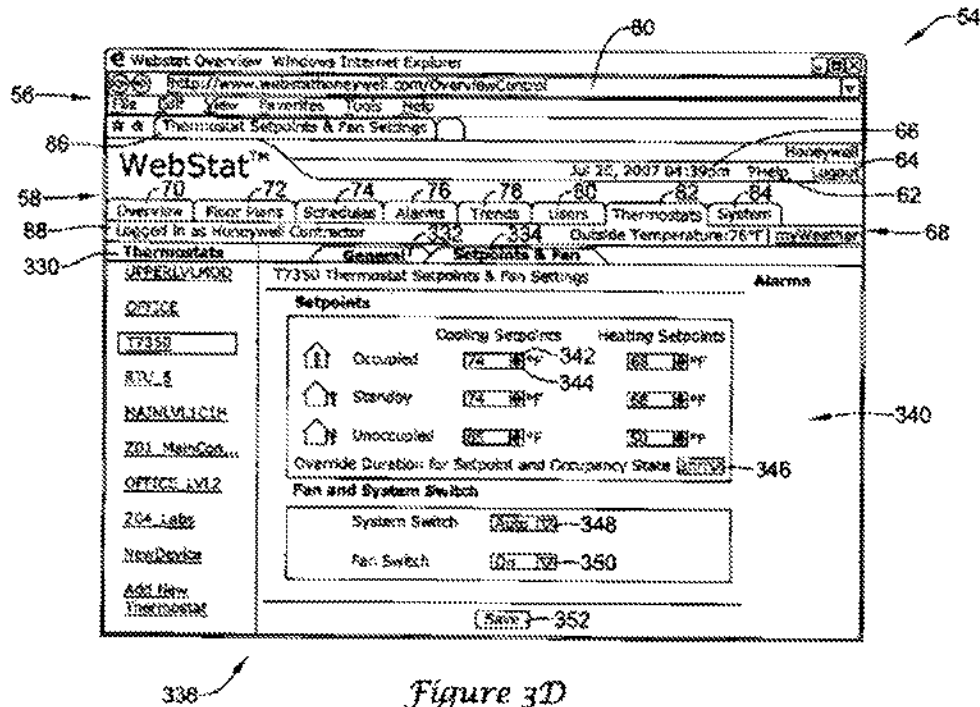


Figure 3D

Figure 3D shows a pull-down menu 348 that serves as a “system switch” to alter a setting such as “[a]uto, cool, heat, and the like”. Ex. E at 12:4-11. Auto, cool and heat are modes in which the HVAC system is “on”. As shown in Figures 3C and 9B, the mode settings also included “off”. Thus, a POSITA would have appreciated that Sullivan disclosed a system in which a interface was configured to allow the user turn the HVAC system of “on” or “off”. Ex. G at ¶¶ 173-77.

Moreover, POSITA would have understood that the HVAC system could be turned on an off by adjusting the system switch between “off” (meaning the HVAC system is to be turned off, or “Auto”, “Cool” or “Heat” (meaning the HVAC

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system is to be turned on). *Id.* It would have been obvious to modify Rhee to incorporate Sullivan's teachings of allowing users to modify the on/off setting of an HVAC system through the client module's web interface, given Rhee's teachings that the user can control the system through its web interface, and the fact that turning an HVAC on or off was basic functionality in any HVAC control system. *Id.* at 178.

* * *

Claim 15 would have been obvious in view of Rhee in combination with Sullivan as shown in the following claim chart.

Claim 15	Rhee and Sullivan
15. The system of claim 7:	<i>See supra</i> SNQP 1 claim 1 claim chart; SNQP 2 claim 7 claim chart.
[a] wherein the interface is configured to allow the user to turn the HVAC system on or off.	<p>"In FIG. 3D, it can be seen that web page 338 includes a pane 340 that includes information regarding setpoint and fan information for thermostat 316 (T7350). In particular, pane 340 displays cooling and heating temperature set points for one or more time periods such as occupied, unoccupied and standby. For example, pane 340 includes an up arrow 342 and a down arrow 344 that may be used to alter the cooling set point temperature during the occupied time period. Pane 340 includes a pull-down menu 346 that may be used to alter a schedule override duration. Pane 340 also includes settings pertaining to a fan switch and a system switch. <i>In particular, pane 340 includes a pull-down menu 348 that may be used to alter a setting such as Auto, cool, heat and the like for the system switch as well as a pull-down menu 350 that may be used to set the fan</i></p>

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Claim 15

Rhee and Sullivan

switch to either On or Auto. A Save button 352 permits a user to save any changes that they have made to the parameters displayed within web page 352. In some instances, the Save button 352 may be omitted, and web server 38 (FIG. 2) may ask a user if changes should be saved if any parameter values or settings were altered and if the user attempts to exit a particular web page by, for example, selecting another tab within navigation bar 58. Alternatively, the changes may automatically be saved.” Ex. E at 11:61-12:17.

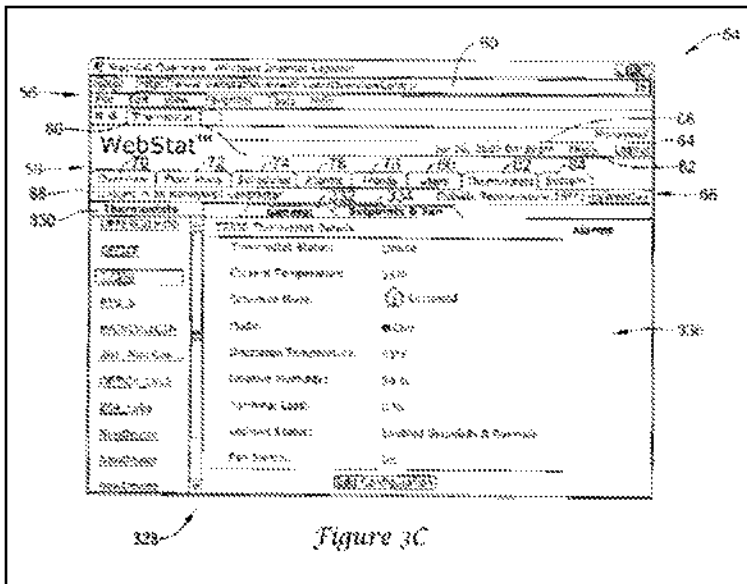


Figure 3C

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6. Sullivan disclosed all elements of claim 16 (which depends from claims 1 and 7).

Claim 16 required that the “interface is configured to allow the user to input that the building is currently unoccupied”. Sullivan disclosed this limitation. Ex. G at ¶¶ 186-187.

As explained above in Section VI.B.7, Rhee taught allowing the user to override the current occupancy mode. Sullivan provided an exemplary interface for doing so via a pull-down menu in a web interface as shown in Figure 3E.

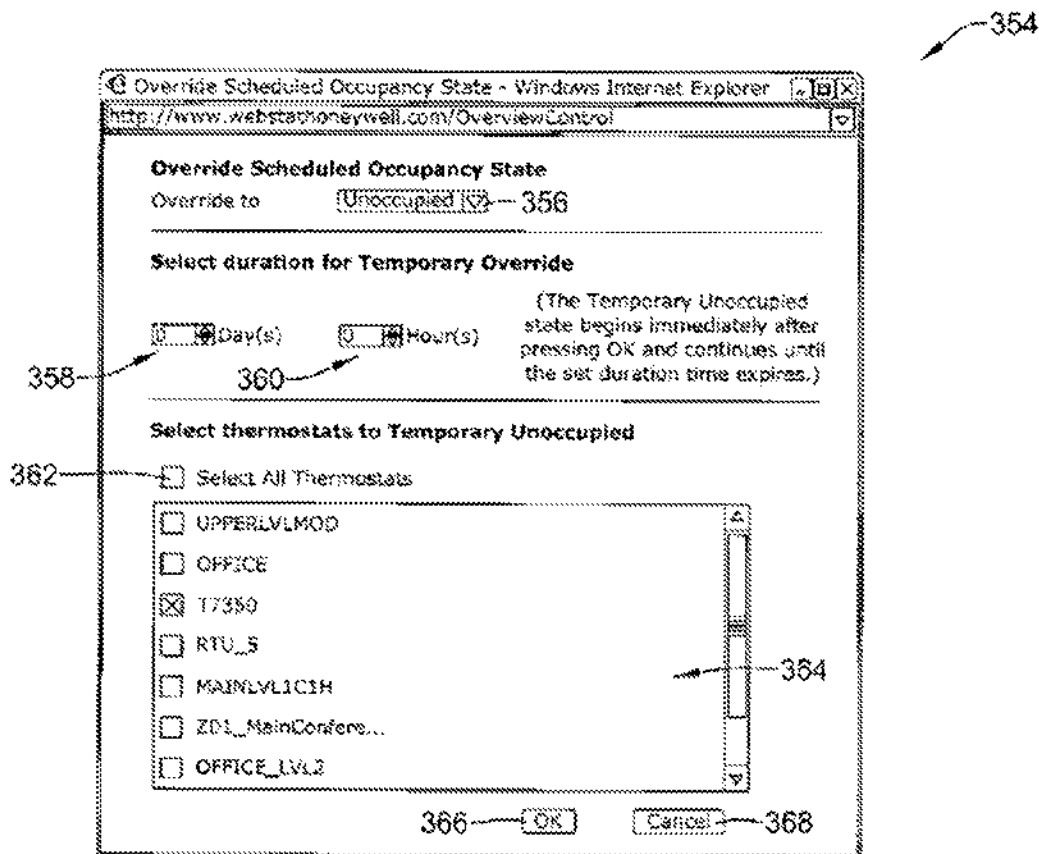


Figure 3E

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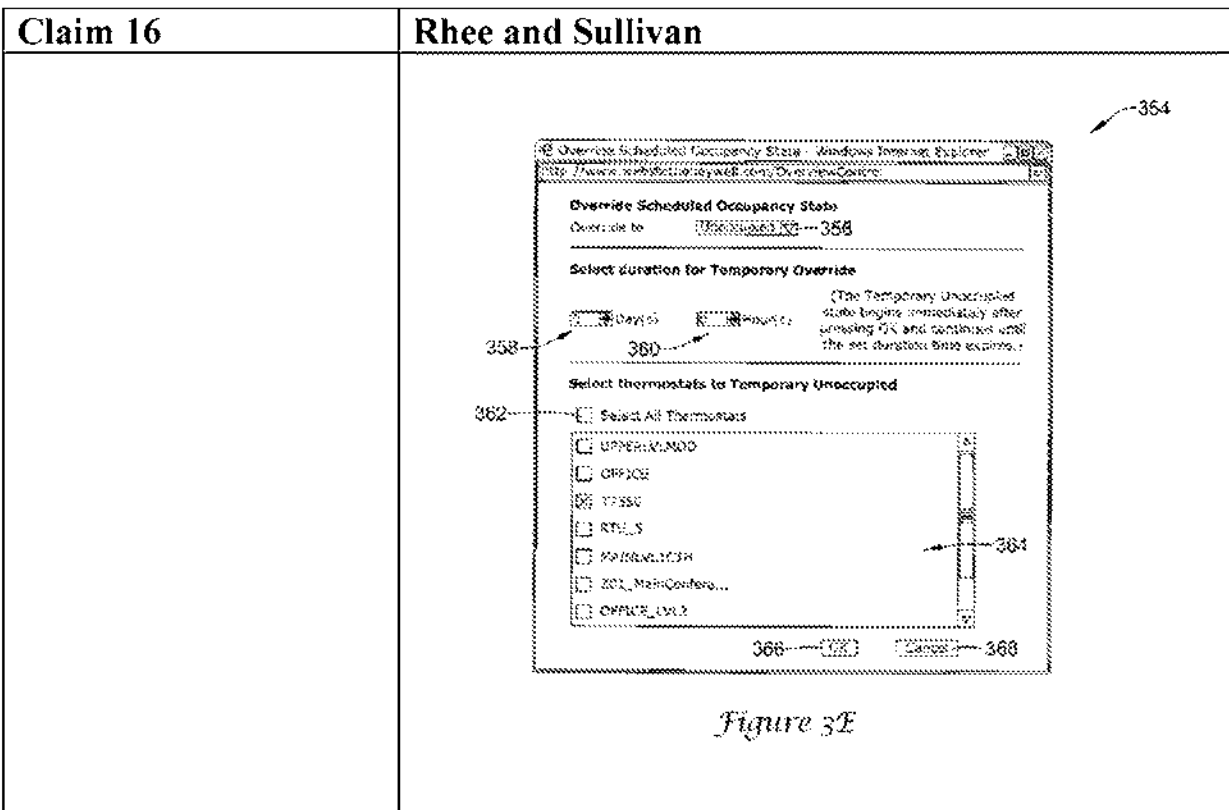
It would have been obvious to combine Sullivan's teaching of allowing a user to input that the system is currently unoccupied via a web page with Rhee's web interface to allow for remote control of the HVAC system. Ex. G at ¶ 187.

* * *

Claim 16 would have been obvious in view of Rhee in combination with Sullivan as shown in the following claim chart.

Claim 16	Rhee and Sullivan
16. The system of claim 7:	<i>See supra</i> SNQP 1 claim 1 claim chart; claim 7 claim chart.
[a] wherein the interface is configured to allow the user to input that the building is currently unoccupied.	<p><i>See supra</i> SNQP 1 claim 1 claim chart at 1[pre], 1[f], 1[h], 1[j].</p> <p>“Returning briefly to FIG. 3B, if a user clicks on override button 326, web server 38 (FIG. 2) may provide web page 354, as seen in FIG. 3E. Web page 354 may be simpler in appearance than web page 54 (FIG. 3B) and may in some instances be a pop-up page that floats atop web page 54. Web page 354 includes a pull-down menu 356, which permits a user to determine how to override the current status of a particular thermostat. <i>For example, if the current status is occupied, a user may override the current status by changing it to unoccupied.</i> A length of the override period may be set using pull-down menu 358, which may be used to set a number of days and/or pull-down menu 360, which may be used to set a number of hours.” Ex. E at 12:18-30.</p>

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7. Motivation to combine Rhee and Sullivan

A POSITA would have been motivated to combine Sullivan with Rhee because both were analogous systems, directed to remotely managing and controlling an HVAC system in a building remotely through a web-based user interface. Ex. C at [0037]; [0040]; [0056]; Ex. E at 1:40-52. Both had similar architectures, comprising a web server accessible over the Internet that was in communication with controllers at a building. Ex. C at Fig. 1B; Ex. E at Fig. 1. Both disclosed sensors that measured inside and outside temperature and reported that data to a server. Ex. C at Fig. 4A & [0102]; Ex. E at 7:51-53, 8:44-63.

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Moreover, as explained above, Rhee disclosed receiving settings of an HVAC system and control of those settings from a mobile device using a web-based interface. Sullivan provided further detail, including exemplary web pages for the display and modification of HVAC settings. A POSITA would look to Sullivan to understand what HVAC settings Rhee's management server could receive from devices in a building to store and display to users, and receive from users to send to devices in a building to affect operations of the devices. Ex. G at ¶¶ 54-55, 148. Web page user interfaces were well known in the art, and it would be straightforward to apply Sullivan's teachings to the web-based client interface of Rhee to meet the limitations of claims 7-9, 15 and 16 of the '382 Patent. *Id.* at 55.

D. SNQP 3: Claims 1-20 are rendered obvious by Rhee in view of Kates.

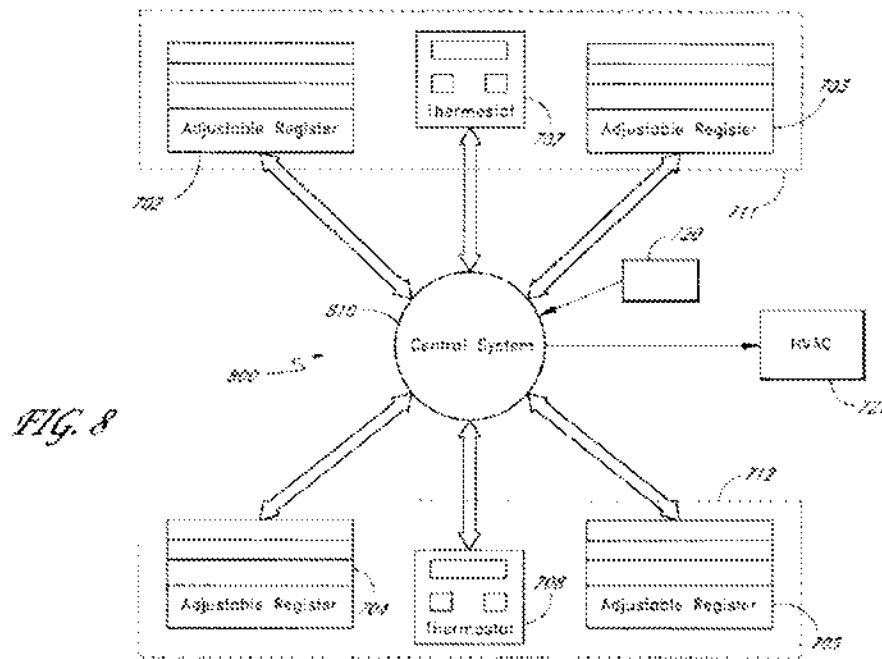
SNQP 3 presents an additional ground of invalidity with respect to claims 1-20 in view of both Kates and Rhee. Kates discloses additional details concerning determining occupancy based on an occupant sensor, and it would have been obvious to incorporate these teachings into Rhee, as set forth below.

1. Overview of Kates.

Kates is directed to a system and method for heating and cooling a home or commercial structure. Ex. D at 1:7-9. In an embodiment of Kates, a central

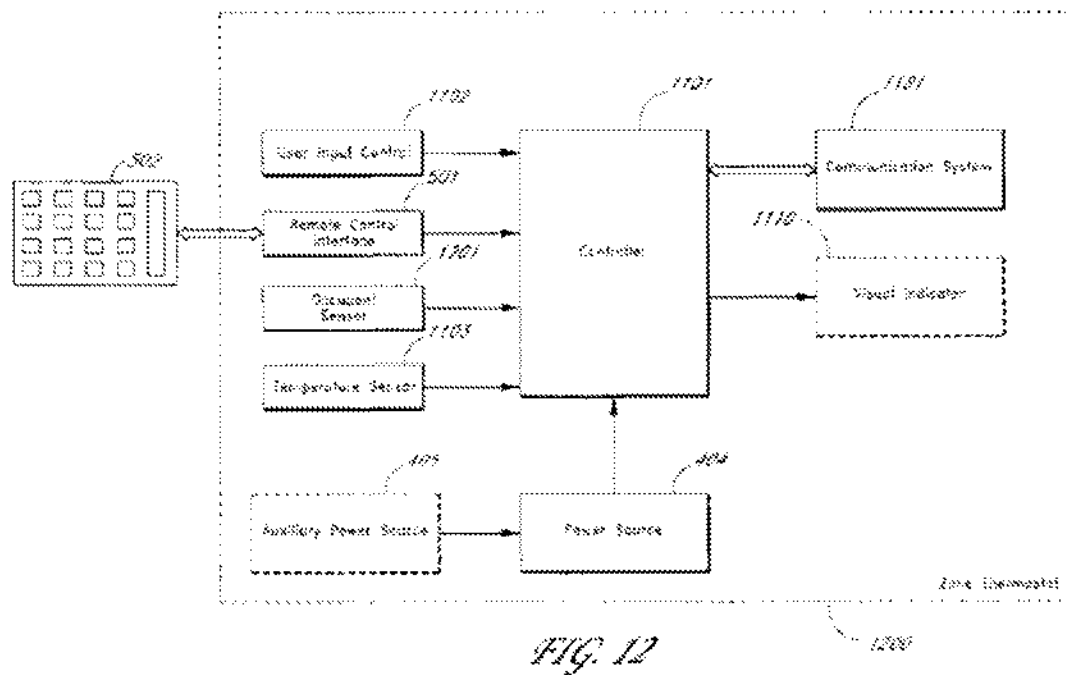
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system communicates with thermostats and an HVAC system to provide heating and cooling. *Id.* at Fig. 8 & 8:62-9:3.



A further embodiment implemented using the architecture of Figure 8 is depicted in Figure 12. In Figure 12, occupant sensor 1201 is provided to controller 1101, and can be, for example, an “infrared sensor, motion sensor, ultrasonic sensor, etc.” *Id.* at 10:10-34.

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Kates teaches the use of occupant sensors to determine whether a zone in the building is occupied (*id.* at 10:18-24) and the central system changes the temperature setpoint according to whether a zone is occupied or unoccupied (*id.* at 10:28-33).

2. Kates disclosed processors that determined “whether the building is occupied or unoccupied” based at least in part on “third data from a motion sensor” and controlled the HVAC system to heat or cool the building at an operation temperature based on the determination.

Claim 1 and its dependent claims require that the one or more processors “determine whether the building is occupied and unoccupied and based on that

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determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature”. Its dependent claim 10 similarly requires that the “determination of whether the building is occupied or unoccupied by one or more processors” be “based on a third data received from a motion sensor”.

Claim 12, which depends from claim 1, requires that the “determination of whether the building is occupied or unoccupied is performed by the first processor”. Claim 17 and its dependent claims 18 and 20 require that the “one or more processors” “receive a third data from a motion sensor” that is used to “determine whether the building is occupied or unoccupied”. Rhee disclosed these limitations as explained with respect to SQNP 1. However, to the extent Rhee is considered insufficient, Kates also disclosed the limitations. Ex. G at ¶¶ 95, 154, 162, 167, 202.

Kates disclosed a central system, which a POSITA would understand from Kates’s disclosures to be a computer system including processors that executed instructions to control the system. Ex. G at ¶ 51; Ex. D at 10:43-51. The central system determined temperature setpoints for an HVAC system based on a determination whether a zone was occupied or unoccupied. Ex. D at 10:28-33. Kates further taught that an occupant sensor, such as a motion sensor, could be used to determine when a zone was occupied or unoccupied. *Id.* at 10:18:21. The central system of Kates used the determination of whether the zone was occupied

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or unoccupied to control the operational temperature of the HVAC system by changing the temperature setpoint. *Id.* at 10:28-33.

Given Rhee's teachings of its management server receiving data from sensors, including a motion detector, and determining occupancy based on an occupancy sensor, it would be have been obvious to combine Rhee with Kates's teaching of using a motion sensor to determine occupancy and to control the HVAC system based on that determination. Ex. G at ¶ 95.

* * *

Claim 1 would have been obvious in view of Rhee in combination with Kates as shown in the following claim chart.

Claim 1	Rhee and Kates
1. A system for controlling an HVAC system at a user's building, the system comprising:	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[pre].
[a] a memory; and	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[a].
[b] one or more processors with circuitry and code designed to execute instructions;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[b].
[c] the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[c].

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Claim 1	Rhee and Kates
measurement of at least one characteristic of the building;	
[d] the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[d].
[e] the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[e].
[f] the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[f].

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Claim 1	Rhee and Kates
<p>[g] the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code via the Internet;</p>	<p><i>See supra</i> SNQP 1 claim 1 claim chart at element 1[g].</p>
<p>[h] the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature;</p>	<p><i>See supra</i> SNQP 1 claim 1 claim chart at element 1[h].</p> <p><i>“In one embodiment, an occupant sensor 1201 is provided to the controller 1101. The occupant sensor 1201, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc. senses when the zone is occupied. The occupants can program the zone thermostat 1201 to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one embodiment, the occupants can program the zoned thermostat 1201 to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g. bedroom, kitchen, etc.), and/or whether the room is occupied or empty. In one embodiment, a group of zones are combined into a composite zone (e.g., a group of zones</i></p>

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Claim 1	Rhee and Kates
	<p>such as an entire house, an entire floor, an entire wing, etc.) and <i>the central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied.</i>” Ex. D at 10:18-33.</p> <p>“<i>In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor, and the control system processor interfaces with personal computer to provide the console 1300 on the personal computer. In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor provided to a hardware console 1300. In one embodiment, the occupants can use the Internet, telephone, cellular telephone, pager, etc. to remotely access the central system to control the temperature, priority, etc. of one or more zones.</i>” <i>Id.</i> at 10:43-54.</p>
[i] wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;	See <i>supra</i> SNQP 1 claim 1 claim chart at element 1[i].

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Claim 1	Rhee and Kates
[j] the first processor with circuitry and code designed to execute instructions to communicate with the memory;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[j].
[k] wherein the memory is configured to store historical values of the first data and second data.	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[k].

Further, claims 2-9, 11, 13-16 and 19, which depend from claim 1, would have been obvious in view of Rhee and Kates, because Rhee disclosed the dependent limitations or at least rendered them obvious as explained above for SNQP 1.

Claim 10 would have been obvious in view of Rhee in combination with Kates as shown in the following claim chart.

* * *

Claim 10	Rhee and Kates
10. The system of claim 4:	<i>See supra</i> SNQP 1 claim 1 claim charts; SNQP 1 claim 2 claim chart; SNQP 1 claim 4 claim chart.
[a] wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.	<i>See supra</i> SNQP 1 claim 10 claim chart. “In one embodiment, an occupant sensor 1201 is provided to the controller 1101. The occupant sensor 1201, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc. senses when the zone is occupied. The occupants can program the zone thermostat 1201 to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one

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Claim 10	Rhee and Kates
	embodiment, the occupants can program the zoned thermostat 1201 to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g. bedroom, kitchen, etc.), and/or whether the room is occupied or empty. In one embodiment, a group of zones are combined into a composite zone (e.g., a group of zones such as an entire house, an entire floor, an entire wing, etc.) and <i>the central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied.</i> ” Ex. D 10:18-33.

Claim 12 was obvious in view of Rhee in combination with Kates as shown in the following claim chart.

* * *

Claim 12	Rhee
12. The system of claim 1:	<i>See supra</i> SNQP 1 claim 1 claim chart.
[a] wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.	<i>See supra</i> SNQP 1 claim 12 claim chart. “ <i>In one embodiment, an occupant sensor 1201 is provided to the controller 1101. The occupant sensor 1201, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc. senses when the zone is occupied. The occupants can program the zone thermostat 1201 to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one embodiment, the occupants can program the zoned thermostat 1201 to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g. bedroom,</i>

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Claim 12	Rhee
	kitchen, etc.), and/or whether the room is occupied or empty. In one embodiment, a group of zones are combined into a composite zone (e.g., a group of zones such as an entire house, an entire floor, an entire wing, etc.) and <i>the central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied.</i> ” Ex. D 10:18-33.

Claim 17 would have been obvious in view of Rhee in combination with Kates as shown in the following claim chart.

* * *

Claim 17	Rhee and Kates
17. A system for controlling an HVAC system at a user's building, the system comprising:	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[pre].
[a] a memory; and	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[a].
[b] one or more processors with circuitry and code designed to execute instructions;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[b].
[c] the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[c]; SNQP 1 claim 4 claim chart.

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Claim 17	Rhee and Kates
least one sensor includes a measurement of the current temperature of the building by the sensor;	
[d] the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature, wherein the second data from the network connection is received via the Internet;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[d]; SNQP 1 claim 5 claim chart.
[e] the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[e].

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Claim 17	Rhee and Kates
[f] the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;	<i>See supra</i> SNQP 1 claim 1 claim chart at claim 1[f].
[g] the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface via on mobile, wireless device running software application code via the Internet;	<i>See supra</i> SNQP 1 claim 1 claim chart at element 1[g].
[h] the one or more processors with circuitry and code designed to	<i>See supra</i> claim 10 claim chart for Rhee and Kates.

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Claim 17	Rhee and Kates
execute instructions to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;	
[i] the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied;	<p><i>See supra</i> SNQP I claim 17 claim chart at element 17[i].</p> <p><i>“In one embodiment, an occupant sensor 1201 is provided to the controller 1101. The occupant sensor 1201, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc. senses when the zone is occupied. The occupants can program the zone thermostat 1201 to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one embodiment, the occupants can program the zoned thermostat 1201 to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g. bedroom, kitchen, etc.), and/or whether the room is occupied or empty. In one embodiment, a group of zones are combined into a composite zone (e.g., a group of zones such as an entire house, an entire floor, an entire wing, etc.) and the central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied.”</i> Ex. D at 10:18-33.</p> <p><i>“In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor, and the control system processor</i></p>

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Claim 17	Rhee and Kates
	<p>interfaces with personal computer to provide the console 1300 on the personal computer. In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor provided to a hardware console 1300. In one embodiment, the occupants can use the Internet, telephone, cellular telephone, pager, etc. to remotely access the central system to control the temperature, priority, etc. of one or more zones.” <i>Id.</i> at 10:43-54.</p>
<p>[j] wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;</p>	<p><i>See supra</i> SNQP 1 claim 1 claim chart at element 1[i].</p>
<p>[k] the first processor with circuitry and code designed to execute instructions to communicate with the memory;</p>	<p><i>See supra</i> SNQP 1 claim 1 claim chart at element 1[j].</p>
<p>[l] wherein the memory is configured to store historical values of the first data and second data.</p>	<p><i>See supra</i> SNQP 1 claim 1 claim chart at element 1[k].</p>

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Further, claims 18 and 20 which depend from claim 17, would have been obvious in view of Rhee and Kates, because Rhee disclosed the dependent limitations or at least rendered them obvious as explained above for SNQP 1.

3. Motivation to combine Rhee and Kates

A POSITA would have been motivated to combine Kates with Rhee because both were analogous systems, directed to controlling an HVAC system in a building. Ex. C at [0037]; [0040]; [0056]; Ex. D at 2:3-7, 2:56-67. Both had similar architectures, comprising controller devices that communicated wirelessly with a central computer. Ex. C at Fig. 1B; Ex. D at Figs. 7A-B, 8, 9; 2:45-57. Both systems also disclosed remote control of the system via the Internet. Ex. C at [0045]; Ex. D at 10:51-54. Both systems included occupancy sensors that detected occupancy which was used to control the operational temperature of an HVAC system. Ex. C at Tbl. 8, [0097]; Ex. D at 10:18-23.

Rhee teaches controlling an HVAC system (including its temperature setpoint) by means of occupancy sensors. Kates provides further explanation about how occupancy sensors, including motion sensors, can be used to determine occupancy and control an HVAC system. It would have been obvious to look to Kates's teachings in this respect given both references were directed to HVAC control systems, and used occupancy sensors as inputs for controlling the HVAC system. Ex. G at ¶ 53.

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E. SNQP 4: Claims 7-9 and 15-16 are rendered obvious by Rhee in view of Kates and Sullivan.

SNQP 3, addresses all claims in view of Rhee in combination with Kates. If SNQP 3 is found insufficient to establish the obviousness of claims 7-9 and 15-16, Rhee and Kates can further be combined with Sullivan as discussed in SNQP 2 above. Rhee in view of Kates renders claims 1-20 obvious, as discussed in SNQP 3 above. Sullivan further teaches the dependent limitations of claims 7-9 and 15-16. Rhee in view of Kates and Rhee's client module in view of the exemplary web-page interfaces of Sullivan would render claims 7-9 and 15-16 obvious, as well for the reasons previously discussed with respect to SNQP 2.

VII. CONCLUSION

For the above reasons, Alarm.com respectfully submits that claims 1-20 of the '382 Patent should be reexamined and declared unpatentable based on the substantial new questions of patentability presented in this Request.

Respectfully submitted,

Dated: February 12, 2021

/David P. Emery/
David P. Emery
Registration No. 55,154

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: John Douglas Steinberg)
)
Patent No: 10,534,382)
)
Date of Patent: January 14, 2020)
)
Title: SYSTEM AND METHOD)
FOR USING A WIRELESS)
DEVICE AS A SENSOR FOR)
AN ENERGY)
MANAGEMENT SYSTEM)
)
Filed: April 3, 2019)
)

Mail Stop "*Ex Parte* Reexam"
Attn: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the following documents has been served via Fed Ex on February 12, 2021:

1. Reexamination Transmittal Form;
2. Request for Reexamination of U.S. Patent 10, 534, 382;
3. Certificate of Service; and
4. Exhibits A-L.

The name and address of the party being serviced is as follows:

EcoFactor, Inc.
Knobbe Martens Olson & Bear LLP
2040 Main Street, 14th Floor
Irvine, CA 92614

Dated: February 12, 2021

Respectfully submitted,

/David P. Emery/

David P. Emery
Registration. No. 55,154



US 10,534,382 B2

(12) **United States Patent**
Steinberg

(10) **Patent No.:** **US 10,534,382 B2**
(45) **Date of Patent:** ***Jan. 14, 2020**

(54) **SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM**

(58) **Field of Classification Search**
CPC F24F 11/006; F24F 11/70; F24F 11/62;
F24F 11/30; F24F 11/56; F24F 2120/12;
(Continued)

(71) **Applicant:** EcoFactor, Inc., Redwood City, CA (US)

(56) **References Cited**

(72) **Inventor:** John Douglas Steinberg, Milbrae, CA (US)

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(73) **Assignee:** EcoFactor, Inc., Palo Alto, CA (US)

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(65) **Prior Publication Data**

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Primary Examiner — Ajay Gijha

Related U.S. Application Data

(74) *Attorney, Agent, or Firm* — Knobbe, Martens, Olson & Bear, LLP

(63) Continuation of application No. 15/002,791, filed on Jan. 21, 2016, now Pat. No. 10,289,131, which is a (Continued)

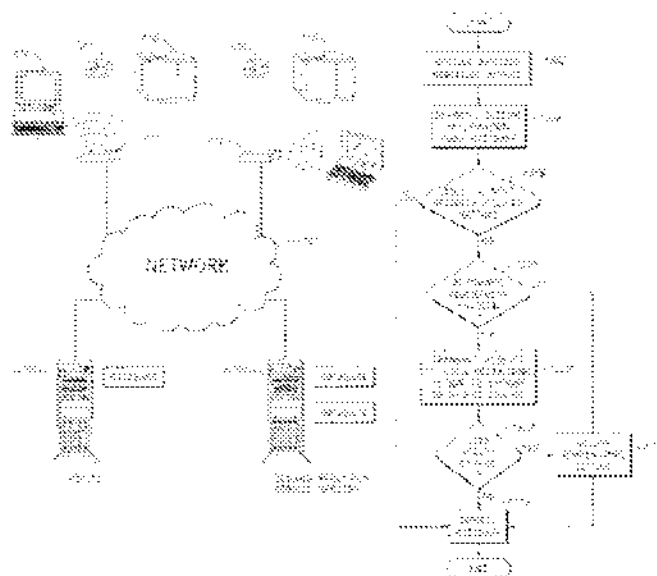
(57) **ABSTRACT**

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G05D 23/00 (2006.01)
G08B 1/08 (2006.01)
(Continued)

The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

(52) **U.S. Cl.**
CPC *G05D 23/00* (2013.01); *F24F 11/30* (2018.01); *F24F 11/62* (2018.01); *F24F 11/70* (2018.01);
(Continued)

20 Claims, 8 Drawing Sheets



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Page 2

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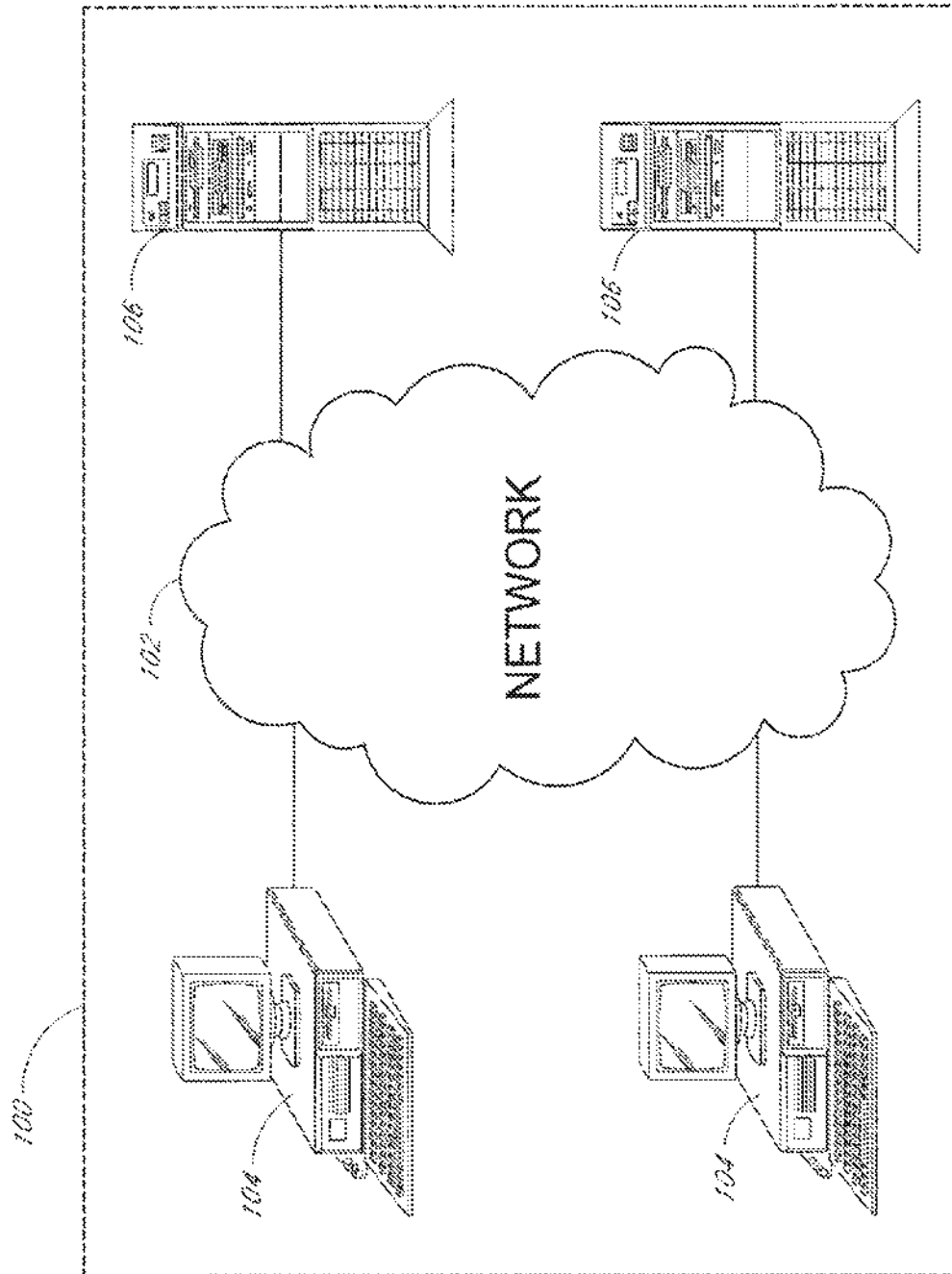


FIG. 1

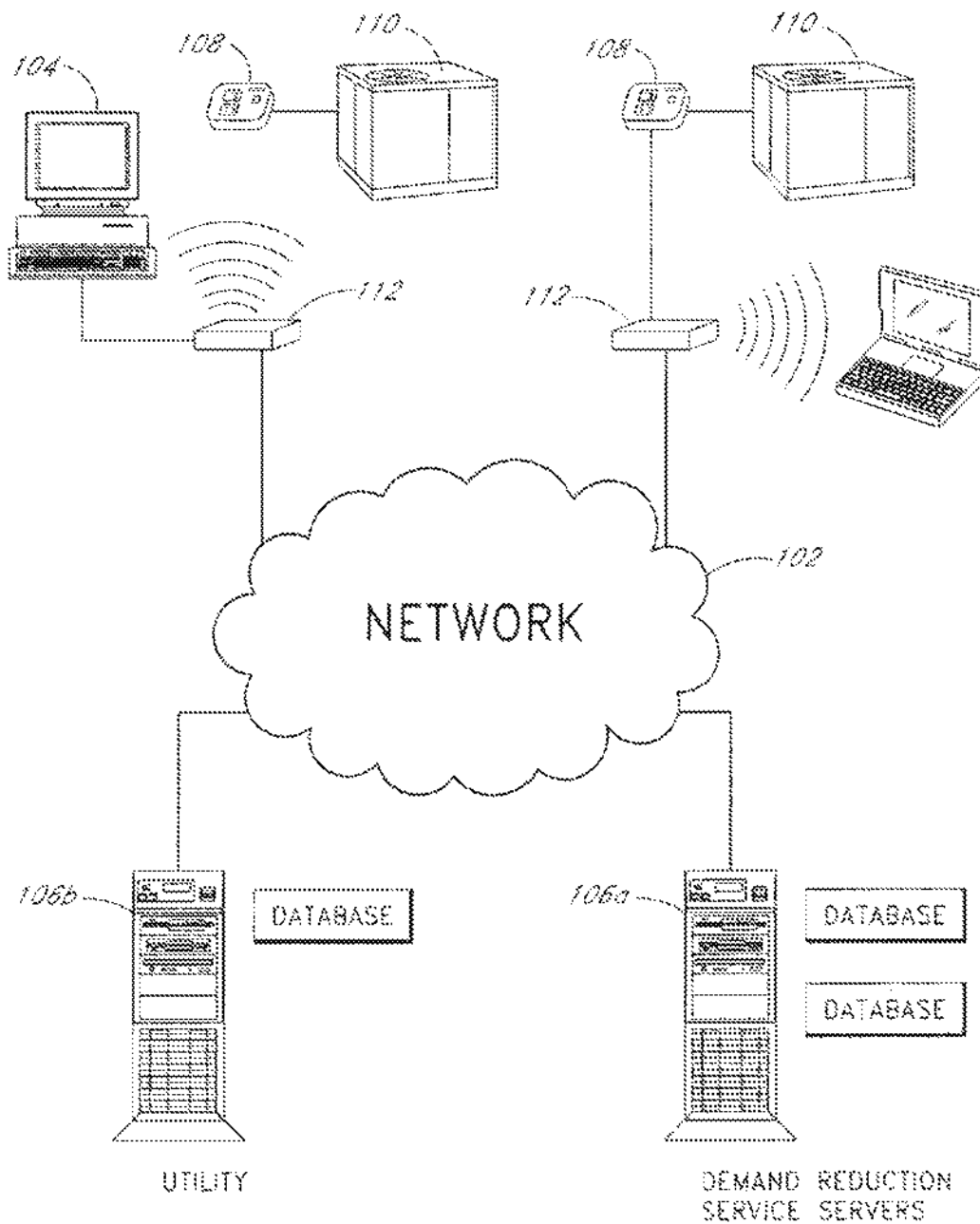


FIG. 2

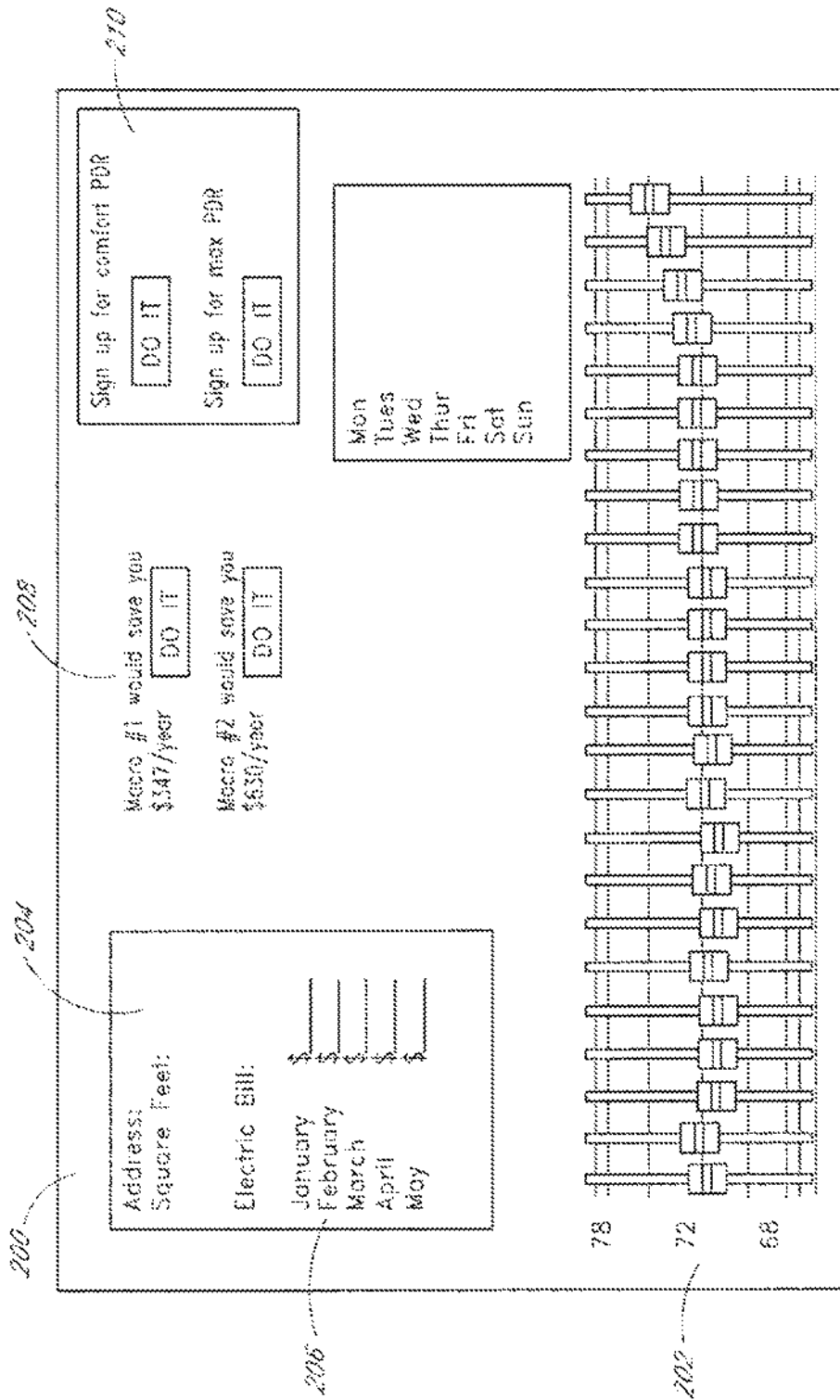


FIG. 3

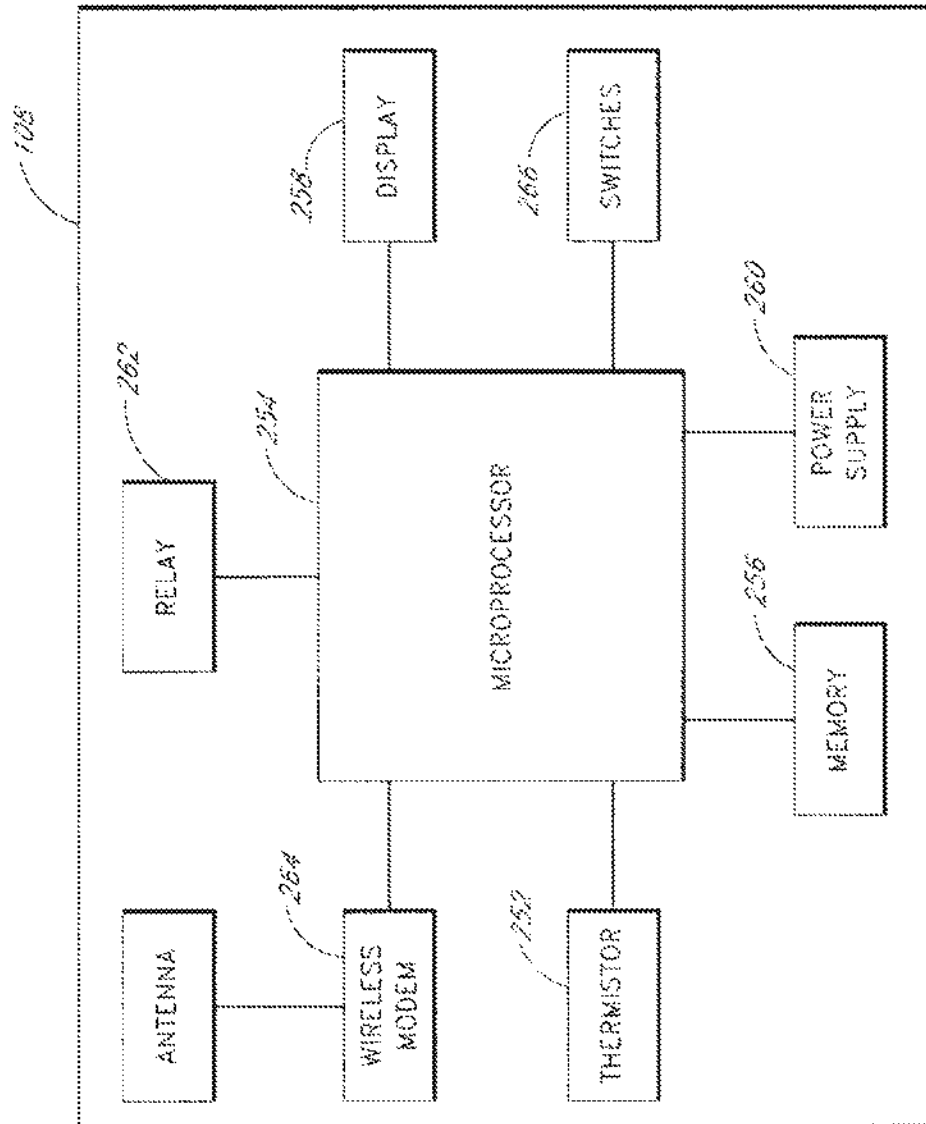


FIG. 4

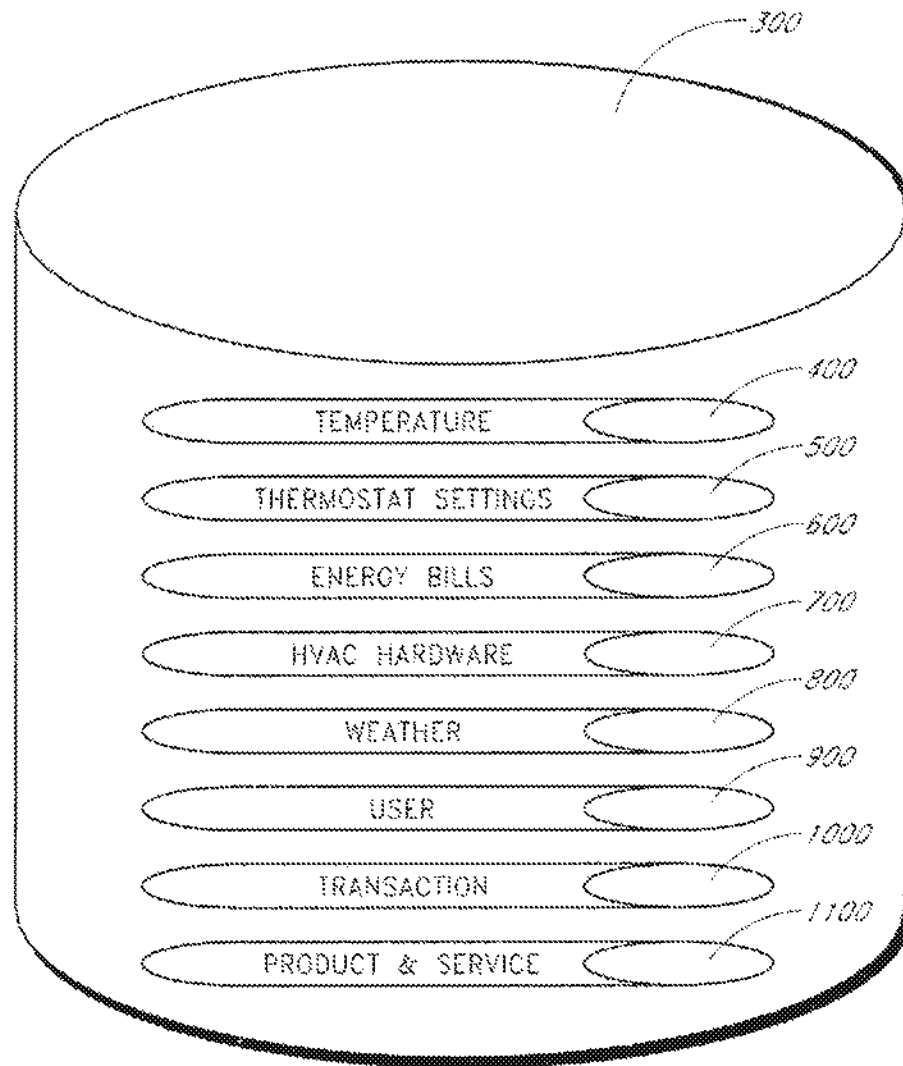


FIG. 5

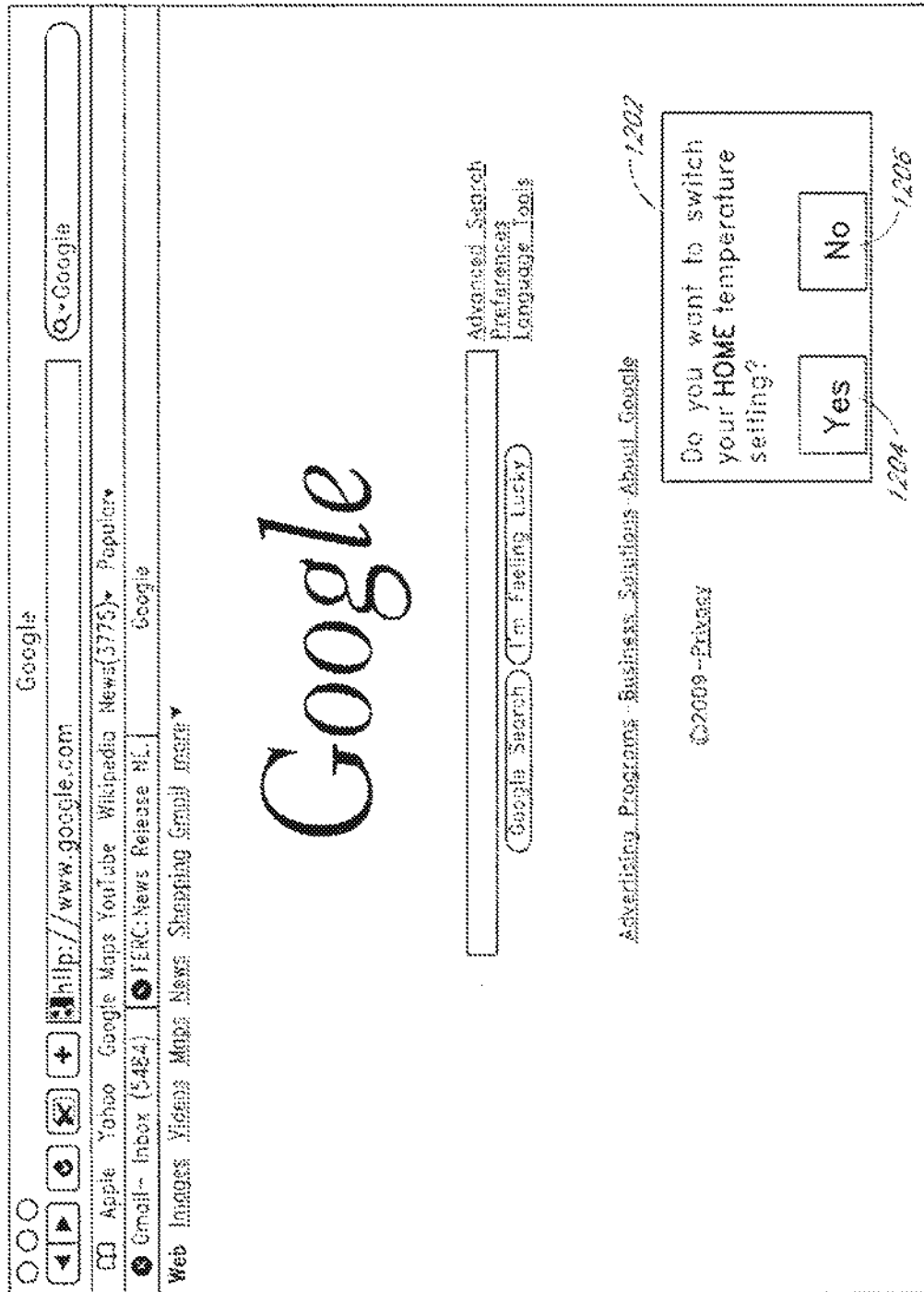


FIG. 6

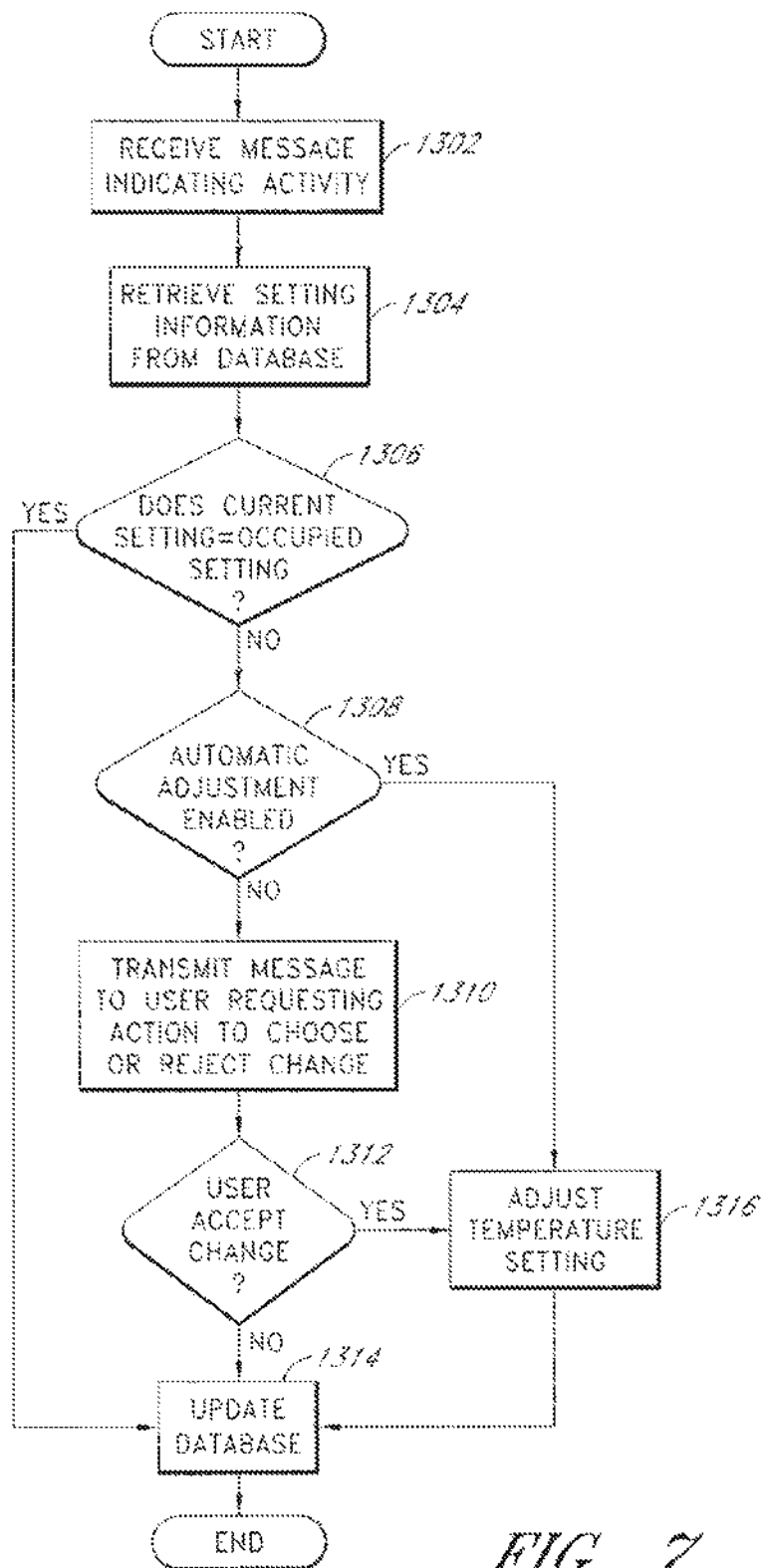


FIG. 7

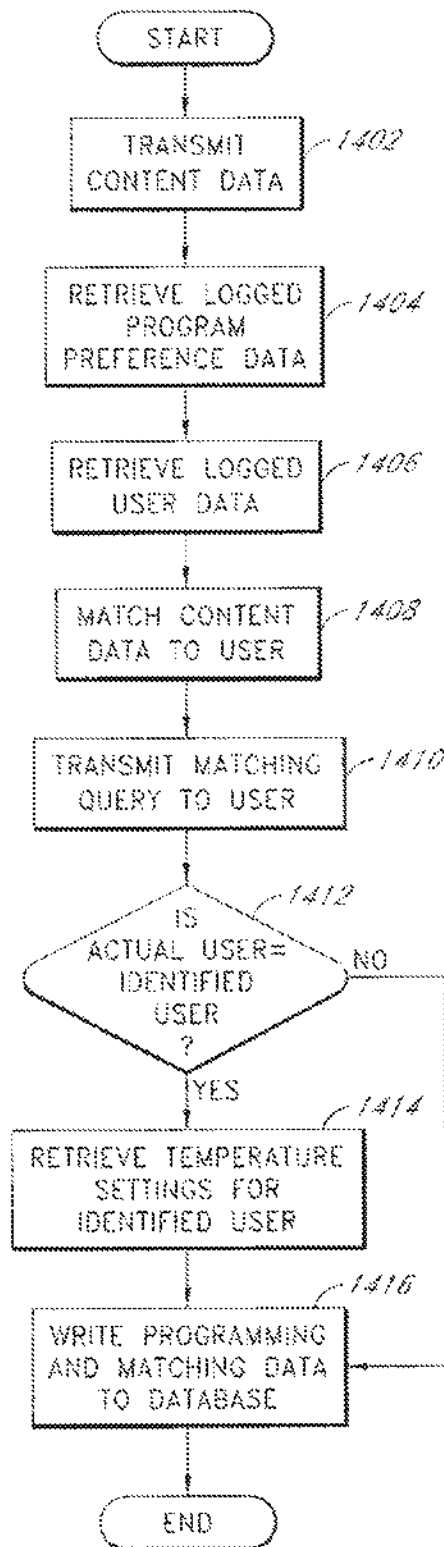


FIG. 8

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SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

RELATED APPLICATIONS

Any and all applications for which a foreign or domestic priority claim is identified in the Application Data Sheet, or any correction thereto, are hereby incorporated by reference into this application under 37 CFR 1.57.

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC, systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals—ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can shift between multiple preset temperatures at different times without real-time involvement of a human being.

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Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at ± 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint—that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by these systems. Hotel guests often run the air conditioner to a low temperature setting and then leave the room for hours, at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system. Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor detects motion (which is assumed to coincide with the return of the guest), the HVAC system reverts to the guest's chosen setting.

Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor

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in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

SUMMARY OF THE INVENTION

In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with one or more computers or other consumer electronic devices which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the thermostats to their HVAC systems. The server also monitors and logs activity on the computers or other consumer electronic devices associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

At least one embodiment of the invention comprises the steps of determining whether one or more networked electronic devices inside a structure are in use; determining whether said use of said networked electronic devices indicates occupancy of said structure; and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

At least one embodiment of the invention comprises at least one said thermostat having at least one temperature setting associated with the presence of one or more occupants in said structure, and at least one temperature setting associated with the absence of occupants in said structure; one or more electronic devices having at least a user interface; where said electronic devices and said thermostat are connected to a network; where said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows an example of an overall environment in which an embodiment of the invention may be used.

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FIG. 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

FIG. 3 shows an embodiment of the website to be used as part of the subject invention.

FIG. 4 shows a high-level schematic of the thermostat used as part of the subject invention.

FIG. 5 shows one embodiment of the database structure used as part of the subject invention.

FIG. 6 shows the browser as seen on the display of the computer used as part of the subject invention.

FIG. 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

FIG. 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

When a user of the subject invention wishes to access information on network 102, the user initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn, establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text, graphical images, audio and video.

In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors may also be used,

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including general-purpose processors, multi-chip processors, embedded processors and the like.

Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Computers 104 can also be microprocessor-controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices. The storage medium may comprise any method of storing information. It may comprise random access memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data. Computers 104 and 106 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like. Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

FIG. 2 illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 112 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served in web pages and viewed by computers 104, as well as databases containing information used by the servers.

In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in FIG. 3. Those components may include a means to enter temperature settings 262, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

FIG. 4 shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252 which may be a thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254, memory 256, a display 258, a power source 260, a relay 262, which runs the HVAC system on an and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE

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802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in FIG. 5, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of the home; the solar orientation of the home; the location of the thermostat in the home; the user's preferred temperature settings; whether the user is a participant in a demand reduction program, etc.

As shown in FIG. 3, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow changing the settings of the temperature for all periods with a single gesture such as a mouse click.

FIG. 6 represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, after the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "no" button 1206. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

FIG. 7 represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 400 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccu-

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pied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

FIG. 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system. In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:30 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you, Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in

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which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

What is claimed is:

1. A system for controlling an HVAC system in a user's building, the system comprising:
 - a memory; and
 - one or more processors with circuitry and code designed to execute instructions:
 - the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;
 - the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet;
 - the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;
 - the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code, wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;
 - the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code via the Internet;
 - the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature;
- wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;
- the first processor with circuitry and code designed to execute instructions to communicate with the memory;
- wherein the memory is configured to store historical values of the first data and second data.

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2. The system of claim 1, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied. In the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.

3. The system of claim 1, wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied. In the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.

4. The system of claim 2, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

5. The system of claim 4, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

6. The system of claim 4, wherein the one or more processors with circuitry and code designed to execute instructions queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

7. The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.

8. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.

9. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.

10. The system of claim 4, wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.

11. The system of claim 1, wherein the network connection is based on the IEEE 802.11 wireless protocol.

12. The system of claim 1, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

13. The system of claim 1, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

14. The system of claim 1, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

15. The system of claim 7, wherein the interface is configured to allow the user to turn the HVAC system on or off.

16. The system of claim 7, wherein the interface is configured to allow the user to input that the building is currently unoccupied.

17. A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and
one or more processors with circuitry and code designed to execute instructions;

the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;

the one or more processors with circuitry and code designed to execute instructions to receive a second

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data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature, wherein the second data from the network connection is received via the Internet;

the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code, wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based in least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface via on mobile, wireless device running software application code via the Internet;

the one or more processors with circuitry and code designed to execute instructions to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;

the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied;

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;

the first processor with circuitry and code designed to execute instructions to communicate with the memory;

wherein the memory is configured to store historical values of the first data and second data.

18. The system of claim 17, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

19. The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

20. The system of claim 17, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

* * * * *

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(19) **United States**(12) **Patent Application Publication**

Rhee et al.

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(75) Inventors: **Sokwoo Rhee**, Lexington, MA (US); **Sheng Lin**, Cambridge, MA (US); **Sean J. Lantry**, Londonderry, NH (US); **Mark D. O'Hearne**, Newton, MA (US); **Martin Bannmann**, Portsmouth, NH (US)

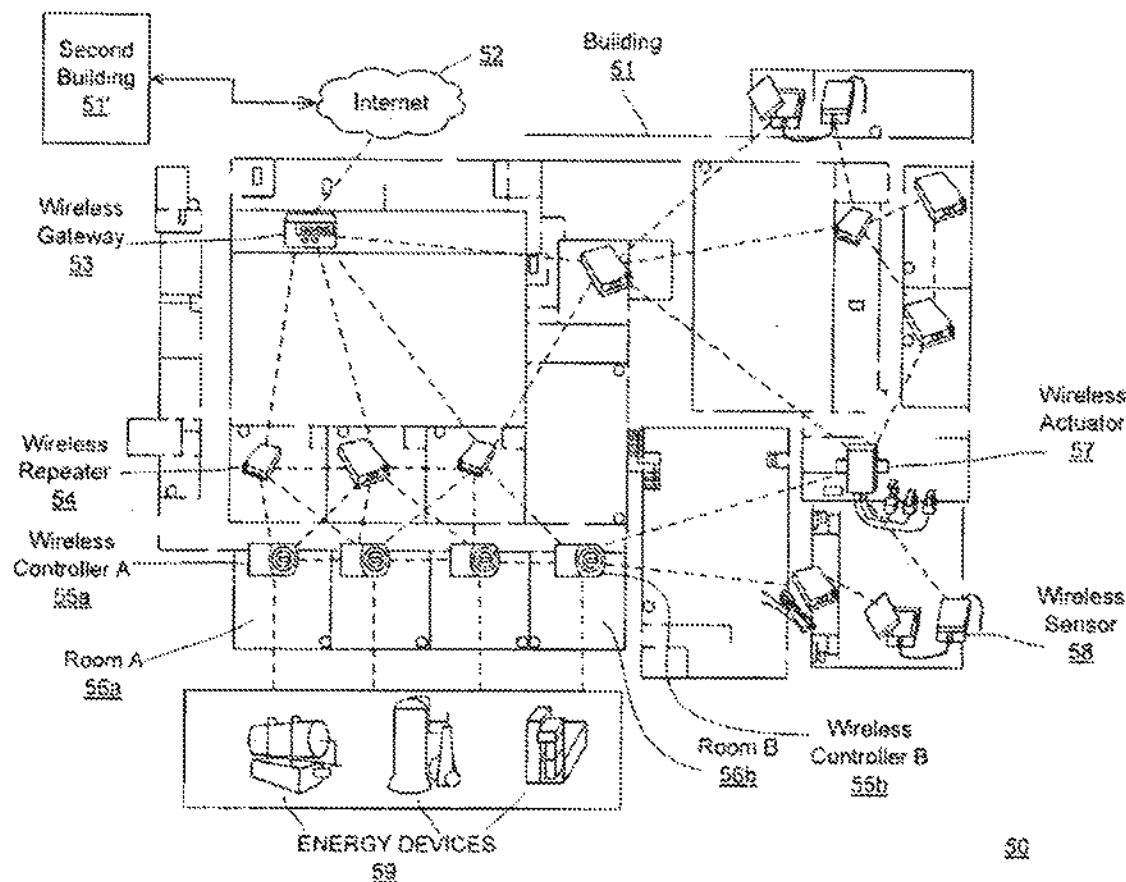
(51) Int. Cl. **G05B 23/02** (2006.01)
 (52) U.S. Cl. **340/3.1**

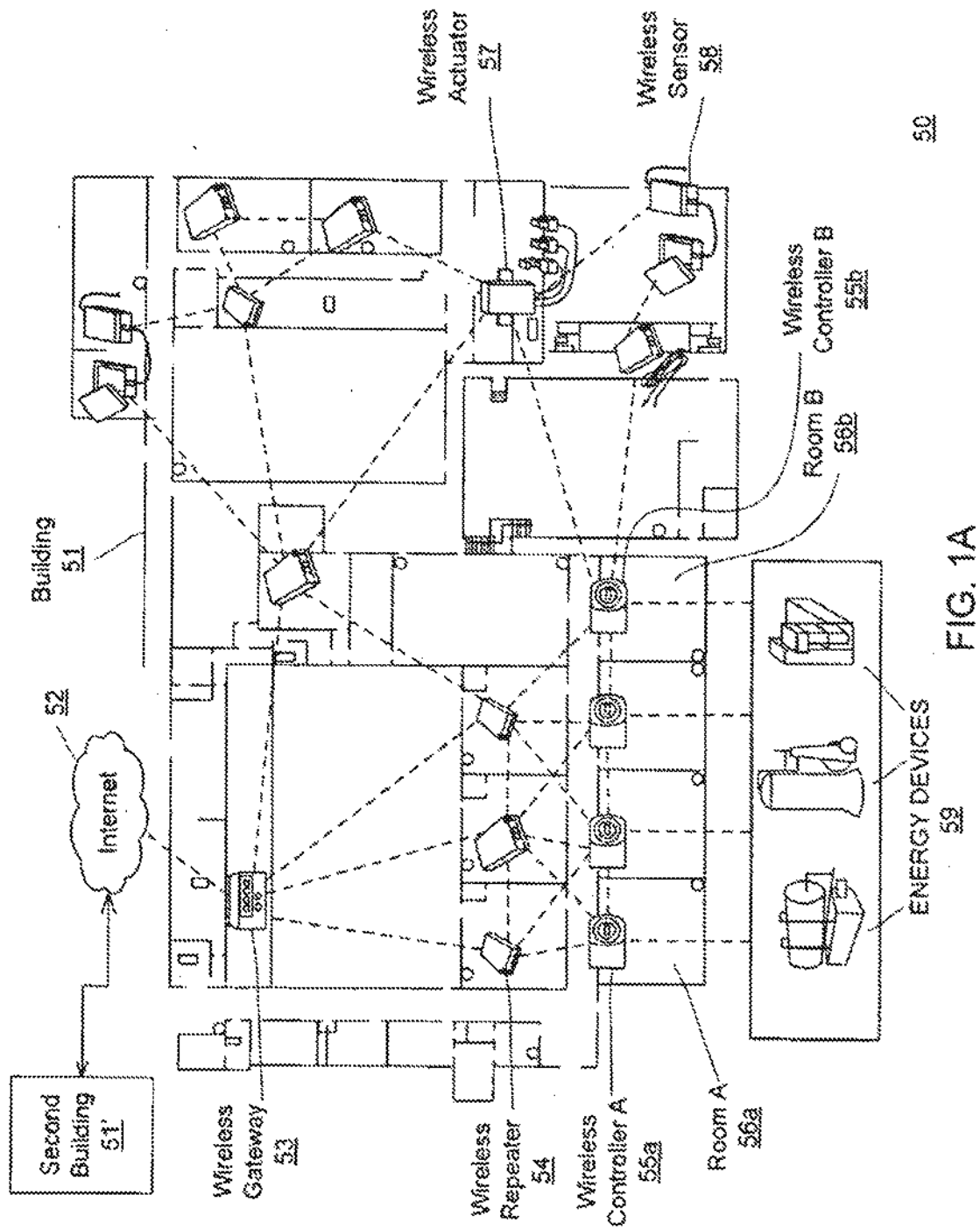
(57) **ABSTRACT**

Correspondence Address:

FOLEY & LARDNER LLP**111 HUNTINGTON AVENUE, 26TH FLOOR
BOSTON, MA 02199-7610 (US)**(73) Assignee: **MILLENNIAL NET, INC.**(21) Appl. No.: **12/136,630**

The energy management system and/or method includes at least one wireless controller in a wireless network and/or a management server. The wireless controller manages at least one energy device based on one or more parts of an energy profile. The management server manages one or more parts of the energy profile, transmits one or more parts of the energy profile to the wireless controller, and receives energy data from the wireless controller.





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FIG. 1A

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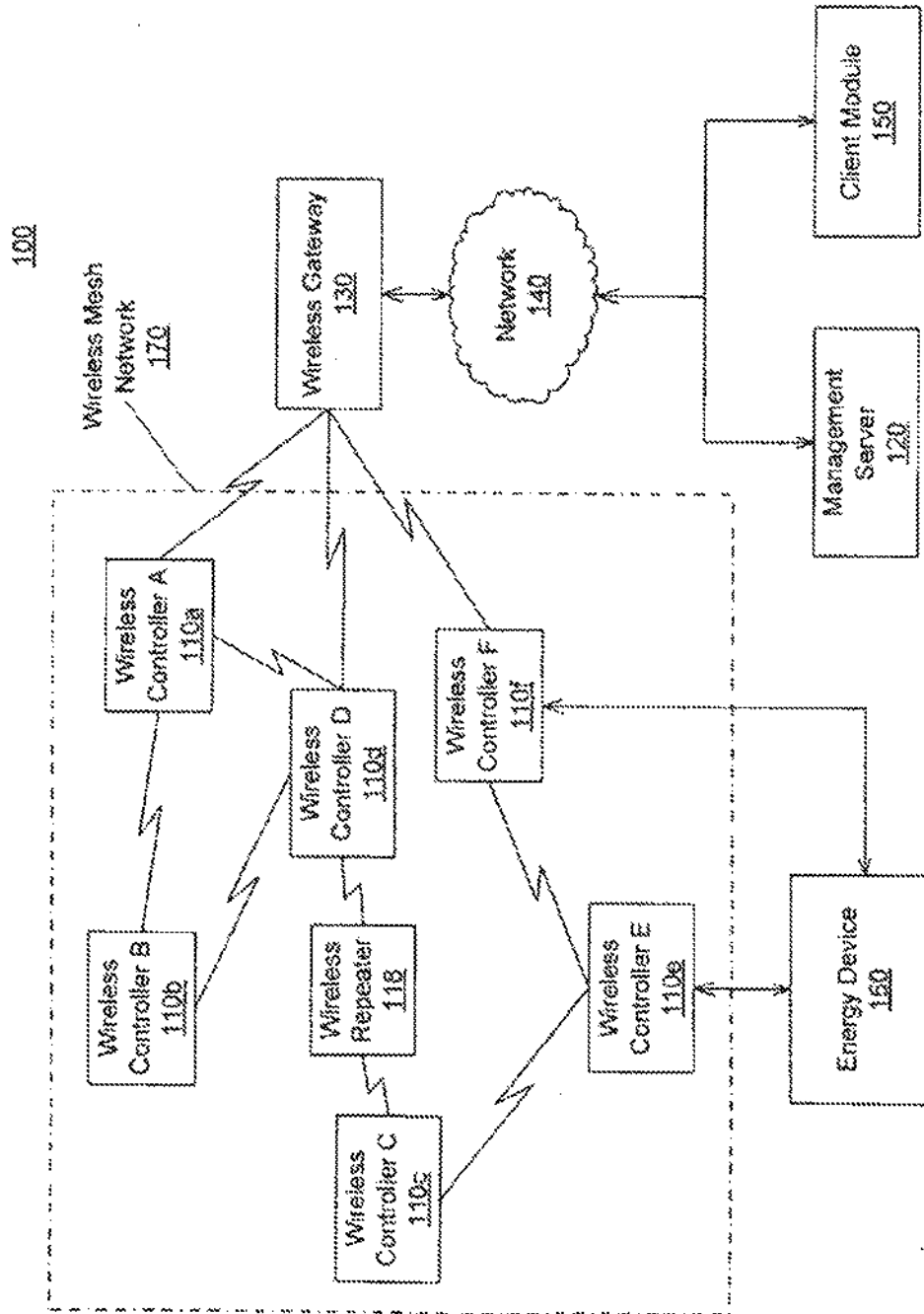


FIG. 1B

200

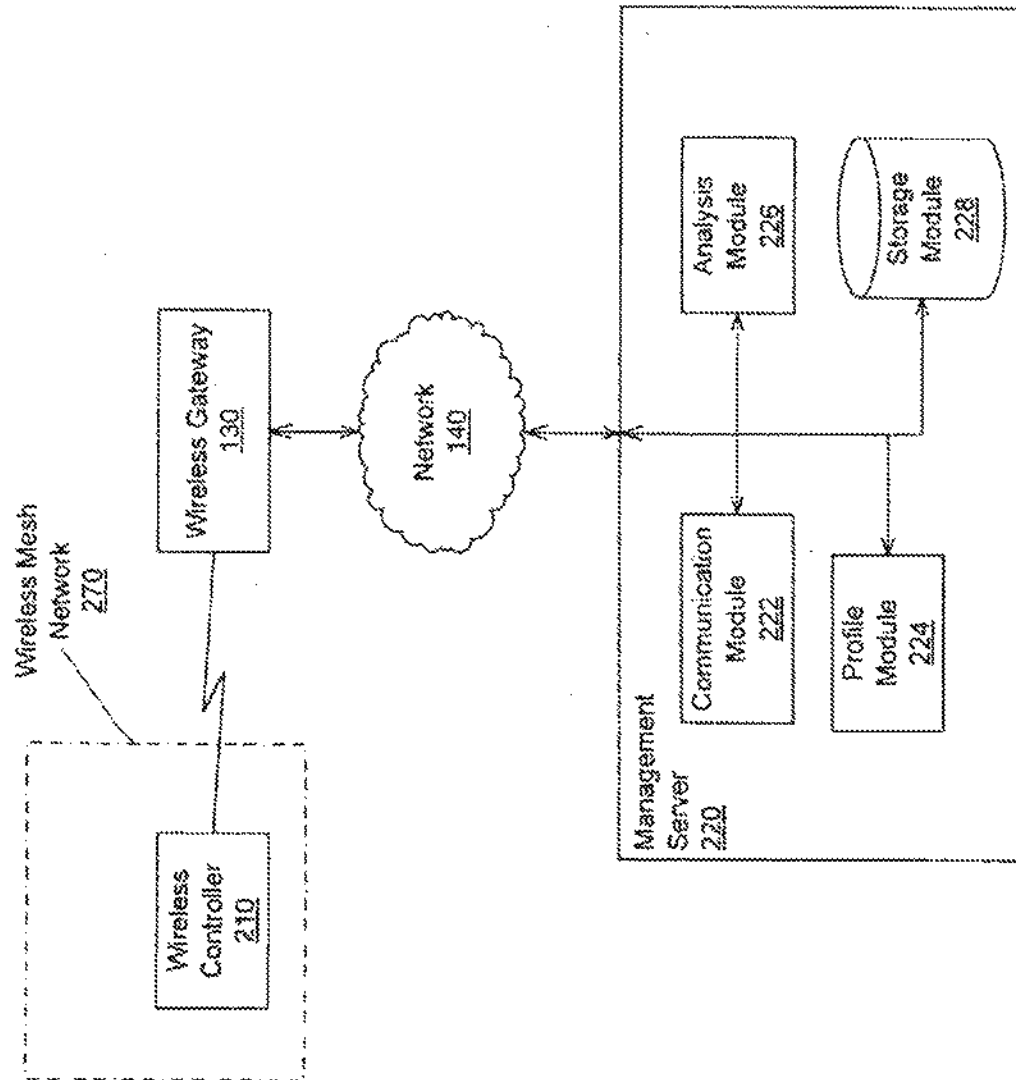


FIG. 2

300

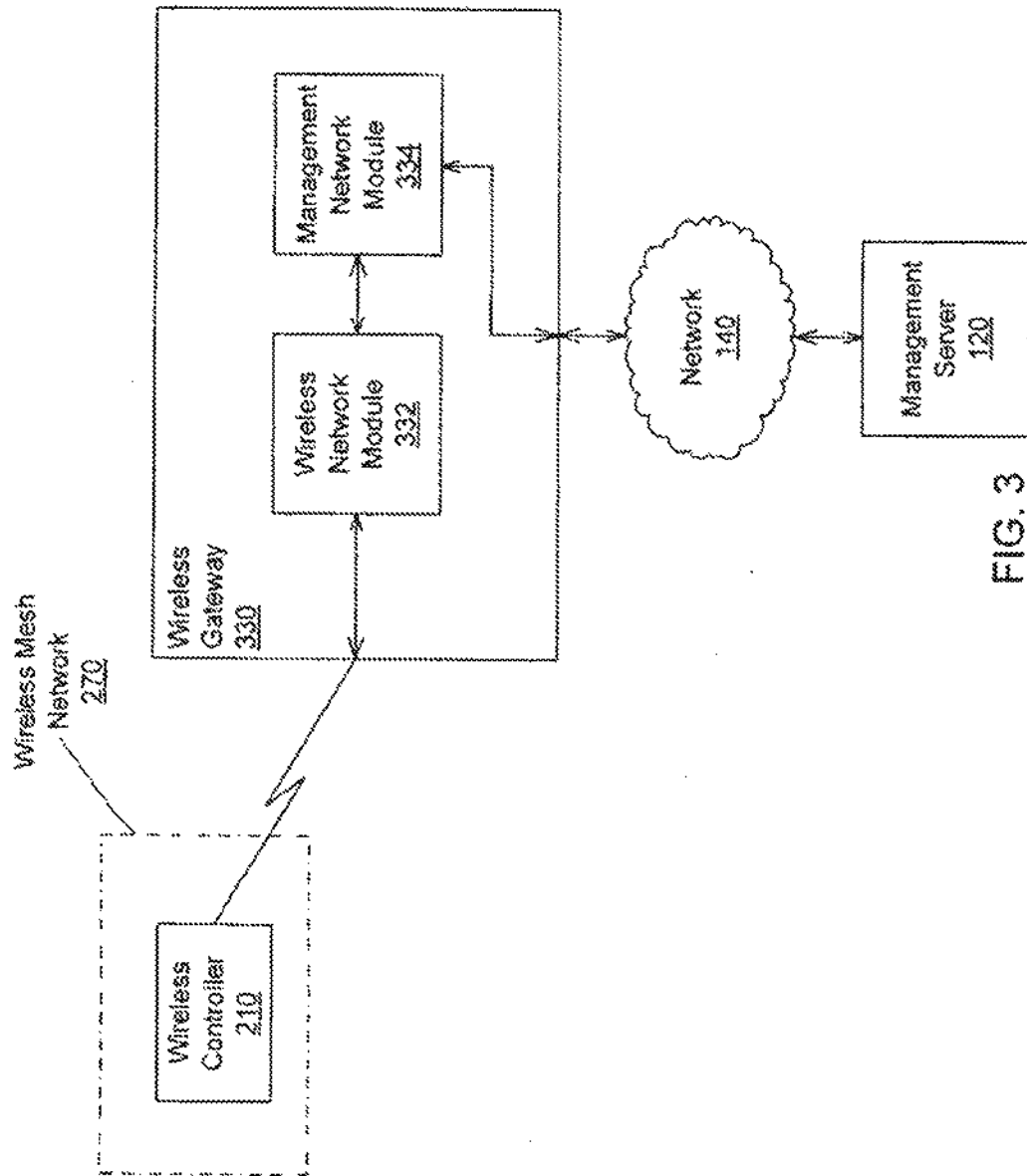
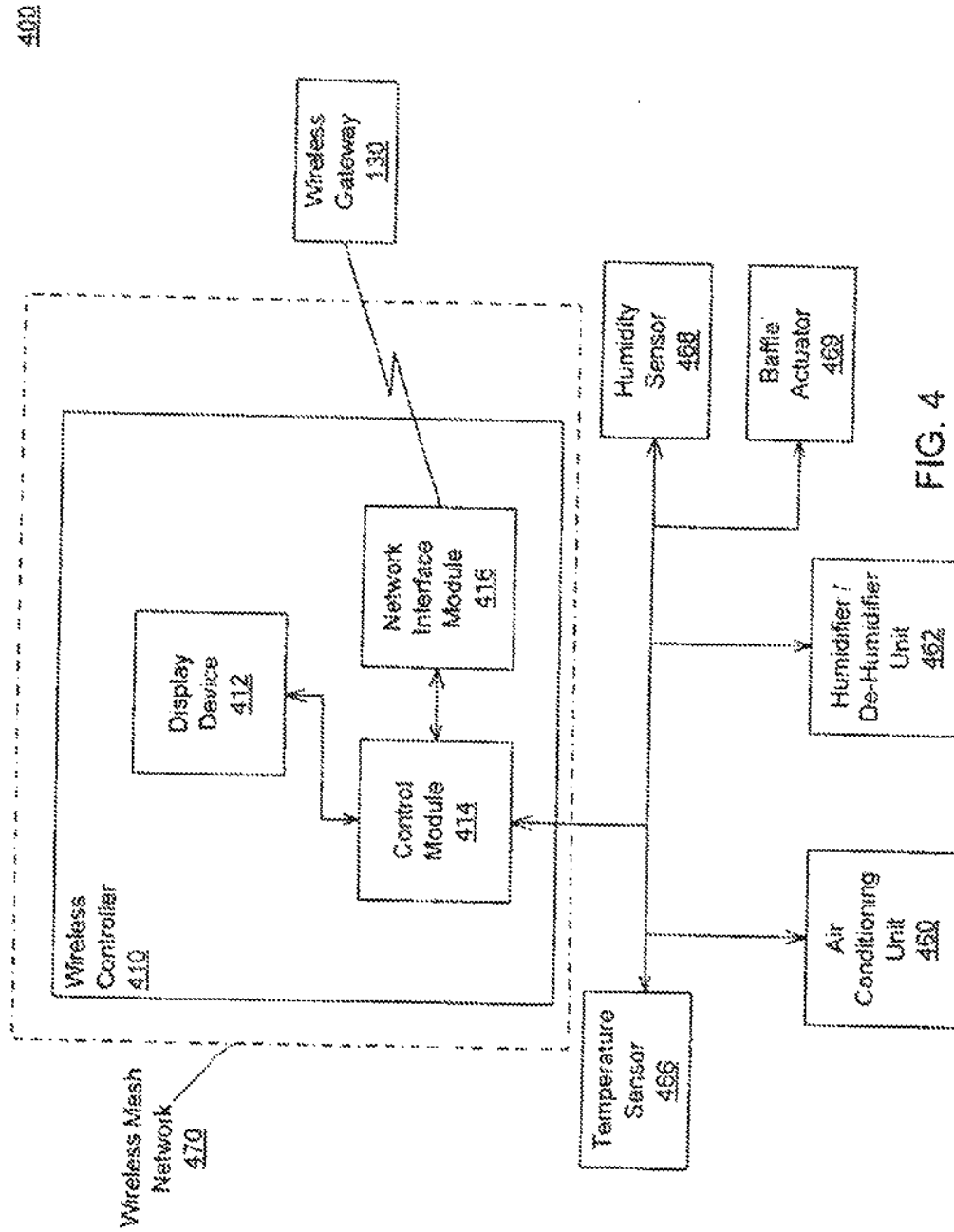


FIG. 3



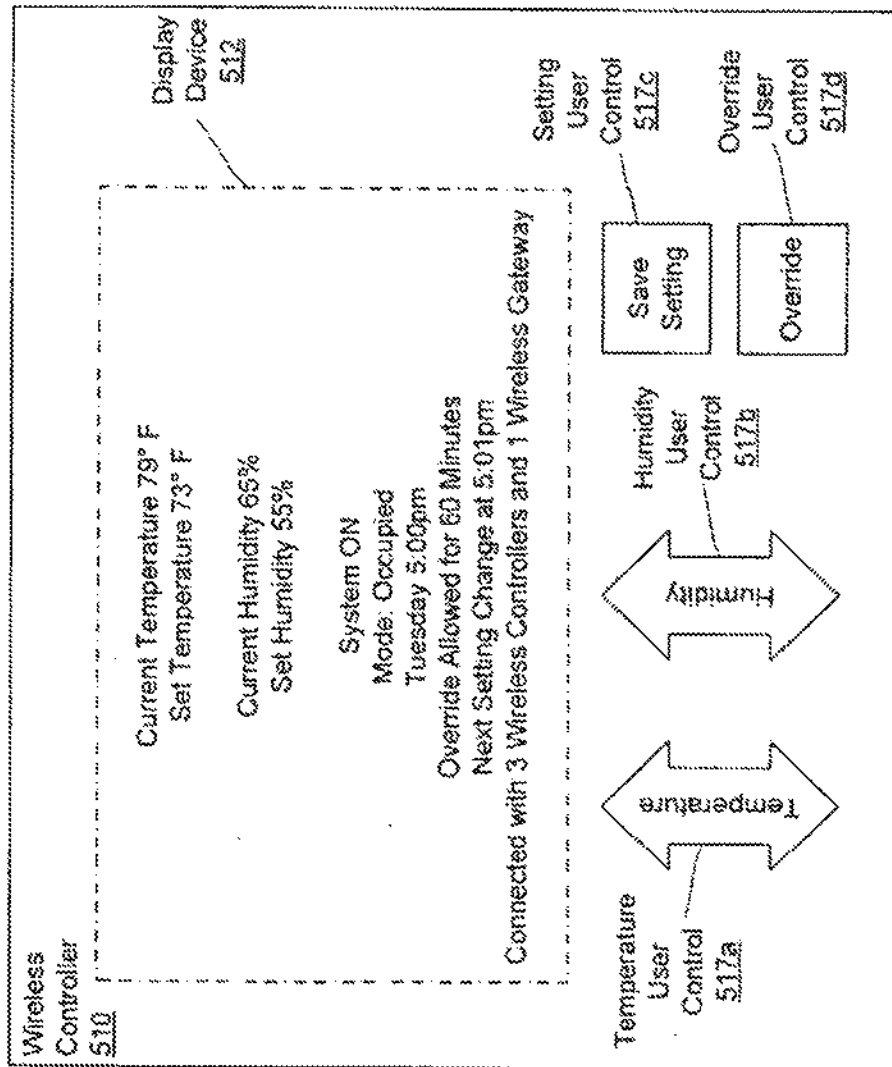


FIG. 5

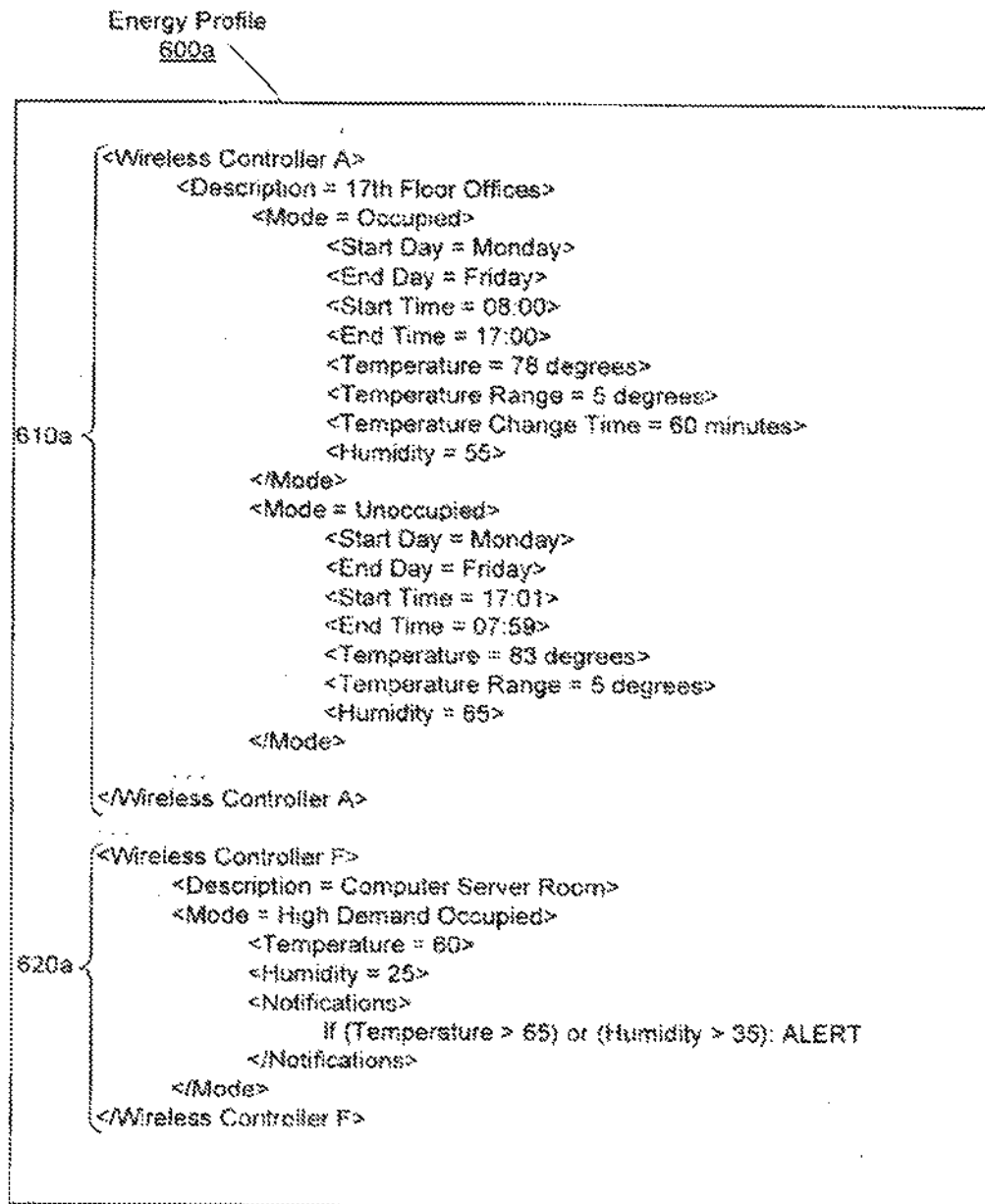


FIG. 6A

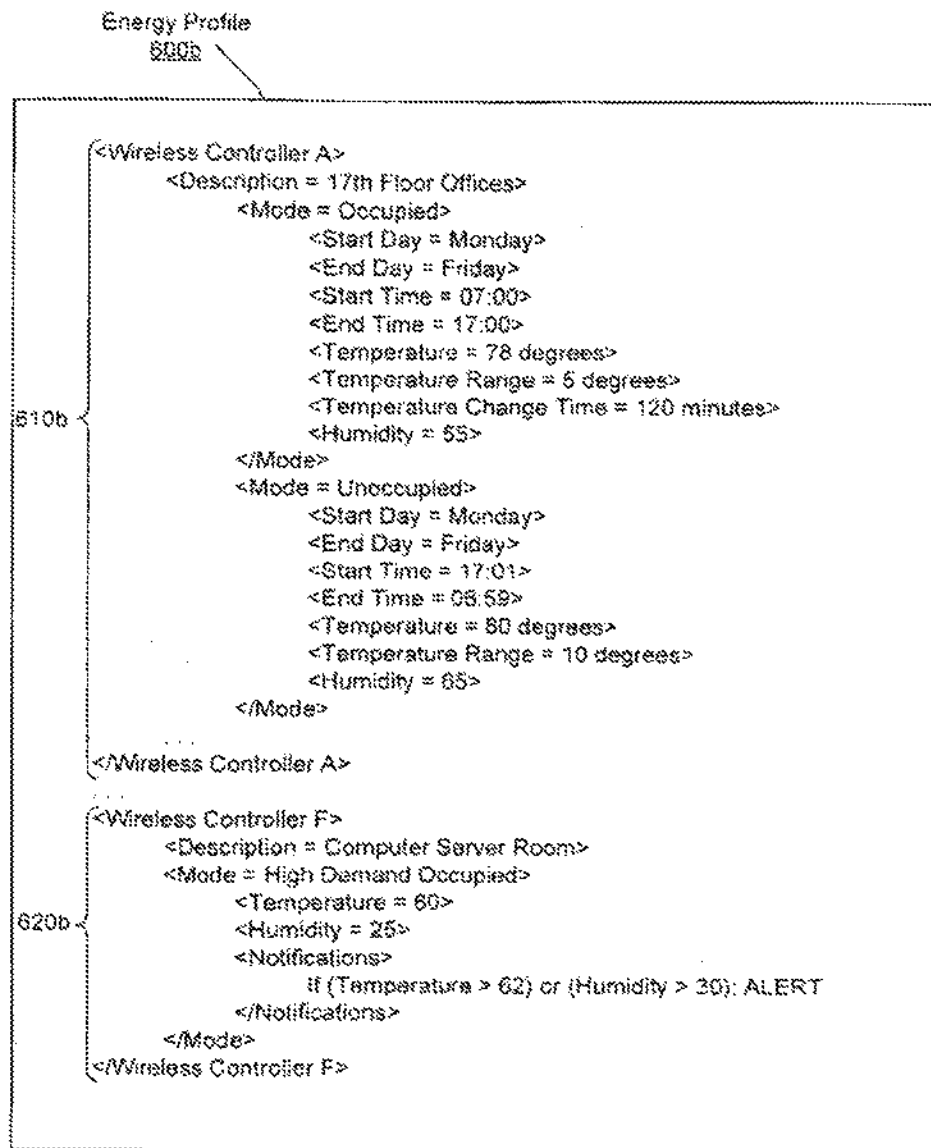


FIG. 6B

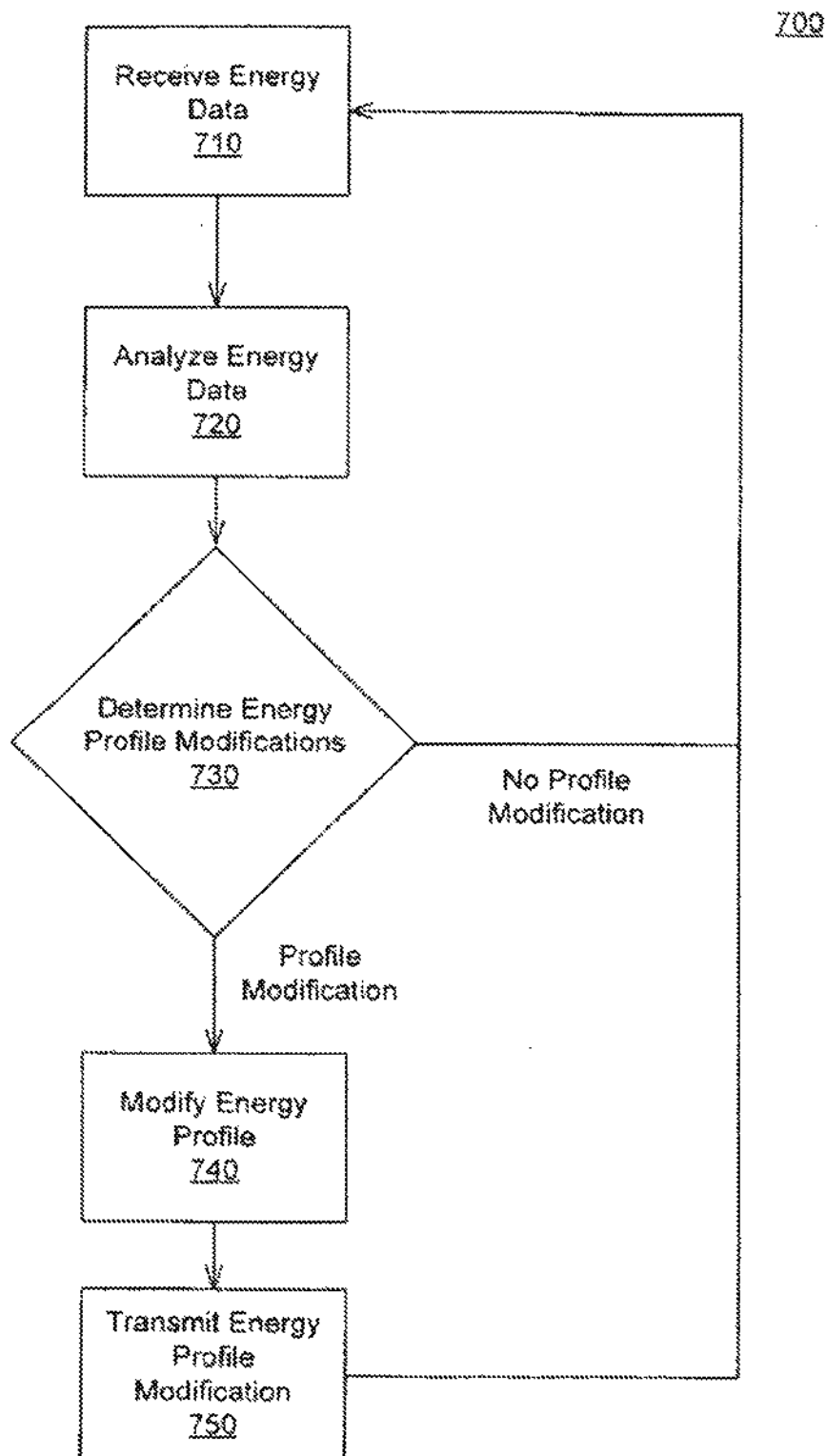


FIG. 7

800

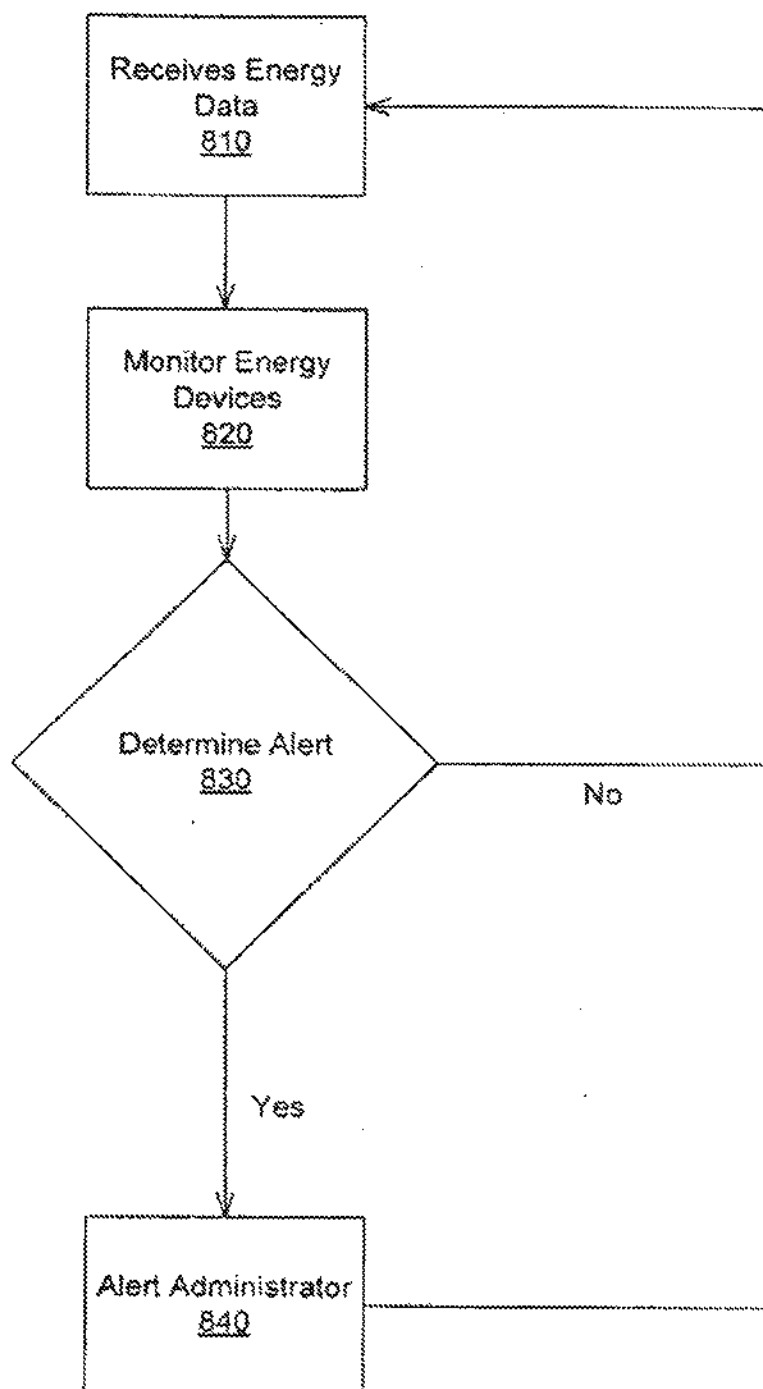


FIG. 8

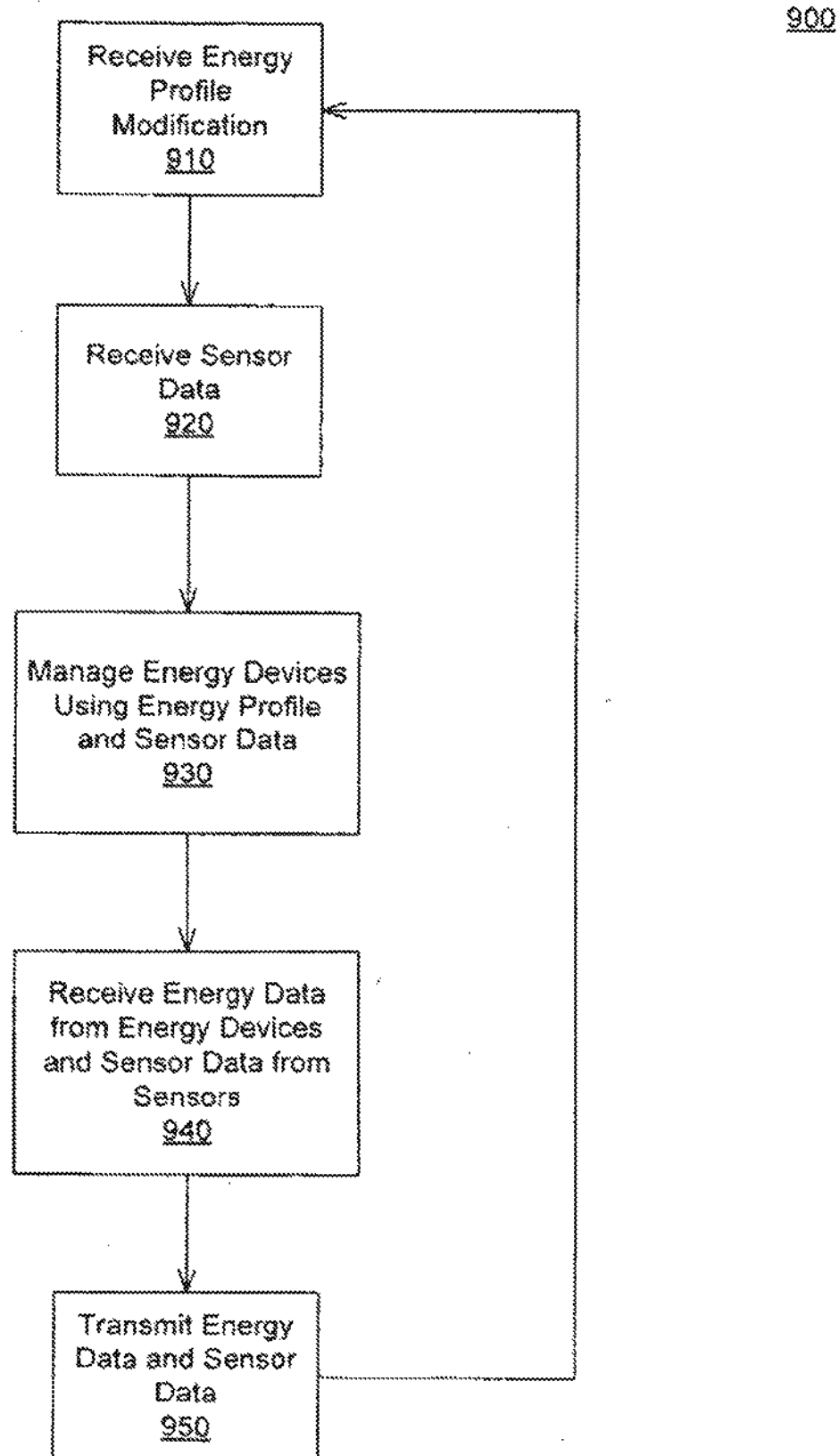


FIG. 9

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SYSTEM AND METHOD FOR ENERGY MANAGEMENT

BACKGROUND

[0001] Energy management saves financial and environmental resources by monitoring and controlling energy consumption to better align it with operational needs and policies, and thereby reduce wasteful energy consumption, associated emissions, and expense. With increasing costs of energy, decreasing availability of non-renewable energy sources, and worsening global pollution and environmental problems, there is need for effective energy management.

[0002] Energy management systems typically include controllers that directly manage energy devices. Historically, energy management systems concentrate management intelligence either individually in the controllers or collectively in a centralized hub that directly controls the controllers. These energy management systems do not allow for the efficient use of the different elements.

SUMMARY OF THE INVENTION

[0003] One approach to energy management is an energy management system. The energy management system includes at least one wireless controller and a management server. The wireless controller is in a wireless network and manages at one or more energy devices based on one or more parts of an energy profile. The management server receives energy data from the wireless controller, manages the one or more parts of the energy profile based on the energy data, and transmits the one or more parts of the energy profile to the wireless controller.

[0004] Another approach of the energy management system includes a means for managing at least one energy device based on one or more parts of an energy profile. The energy management system further includes a means for receiving energy data from the wireless controller and a means for managing the one or more parts of the energy profile based on the energy data. The energy management system further includes a means for transmitting the one or more parts of the energy profile to the wireless controller.

[0005] An additional approach to energy management includes a method for energy management. The method includes receiving, by a management server, energy data from at least one wireless controller in a wireless network. The method further includes modifying, by the management server, one or more parts of the energy profile based on the energy data and transmitting, by the management server, one or more parts of modified energy profile to the wireless controller. The method further includes managing, by the wireless controller, one or more energy devices based on the one or more parts of the modified energy profile.

[0006] Another approach to energy management is a management server. The management server includes a communication module, an analysis module, and a profile module. The communication module receives energy data from one or more wireless controllers and one or more energy devices associated with the wireless controllers. The analysis module analyzes the energy data to create modifications for one or more parts of an energy profile. The profile module manages the one or more parts of the energy profile and modifying the one or more parts of the energy profile based on the modifi-

cations. The communication module transmits the modified one or more parts of the energy profile to the wireless controllers.

[0007] An additional approach to energy management is a management server. The management server includes a means for receiving energy data from one or more wireless controllers and one or more energy devices associated with the wireless controllers and a means for analyzing the energy data to create modifications for one or more parts of an energy profile. The management server further includes a means for managing the one or more parts of the energy profile and a means for modifying the one or more parts of the energy profile based on the modifications. The communication module transmits the modified one or more parts of the energy profile to the wireless controllers.

[0008] Another approach to energy management is a method for energy management. The method includes receiving energy data from one or more wireless controllers and one or more energy devices associated with the wireless controllers and analyzing the energy data to create modifications for one or more parts of an energy profile. The method further includes modifying the one or more parts of the energy profile based on the modifications and transmitting the modified one or more parts of the energy profile to the wireless controllers.

[0009] An additional approach to energy management is a wireless controller. The wireless controller includes a control module and a network interface module. The control module manages at least one energy device based on one or more parts of an energy profile. The network interface module transmits energy data to a management server and receives the one or more parts of the energy profile from the management server.

[0010] Another approach to energy management is a wireless controller. The wireless controller includes a means for managing at least one energy device based on one or more parts of an energy profile and a means for transmitting energy data to a management server. The wireless controller further includes a means for receiving the one or more parts of the energy profile from the management server.

[0011] An additional approach to energy management is a method for energy management. The method includes monitoring at least one energy device based on one or more parts of an energy profile and transmitting energy data to a management server. The method further includes receiving the one or more parts of the energy profile from the management server.

[0012] In other examples, any of the approaches above can include one or more of the following features. The energy device includes at least one of an energy-consuming device or an energy-producing device. The wireless network includes a wireless mesh network. The wireless controller self-configures the wireless mesh network to forward and/or route communication between the wireless controller and the management server.

[0013] In some examples, the system includes a wireless repeater for extending a range of the wireless mesh network. The system includes one or more wireless sensors to collect the energy data or parts thereof and transmit the energy data or parts thereof via the wireless network to the wireless controller.

[0014] In other examples, the system includes a wireless sensor to monitor the energy device. The wireless sensor is managed by the wireless controller. The wireless sensor monitors the electrical current and power of the energy device. The wireless sensor measures a temperature, an envi-

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omental level of carbon dioxide, an environmental level of carbon monoxide, and/or a pressure.

[0015] In some examples, a wireless gateway communicates between the wireless network and the management server. The management of the energy device includes controlling, directing, and/or monitoring the energy device. The energy data includes energy consumption data, environmental data, and/or energy generation data. The wireless network includes a wireless mesh network. The wireless mesh network is self-configured to forward and/or route communication between the wireless controller and the management server.

[0016] In other examples, one or more wireless sensors collect the energy data or parts thereof and transmit the energy data or parts thereof via the wireless network to the wireless controller. A wireless sensor monitors the energy device. The wireless controller manages the wireless sensor.

[0017] In some examples, the system further includes a client module for remote management of the management server. The system further includes a storage module for storing the energy data, the modifications for one or more parts of the energy profile, the one or more parts of the energy profile, or any combination thereof.

[0018] In other examples, the analysis module further creates a report based on the energy data. The analysis module further determines an alert based on the energy data. The energy profile includes one or more operational modes. The energy profile includes a schedule specifying the operational mode utilized in a given timeframe. The schedule includes a hierarchy of one or more sub-schedules. The schedule includes at least one of a default schedule, a vacation schedule, or a special event schedule.

[0019] In some examples, the system includes a client module for remotely managing the management server. The system further includes a storage module for storing the energy data, the modifications for one or more parts of the energy profile, and/or the one or more parts of the energy profile.

[0020] In other examples, the analysis module creates a report based on the energy data. The analysis module determines an alert based on the energy data.

[0021] In some examples, the network interface module routes and/or forwards communications via a wireless mesh network. The control module manages the energy device based on second energy data collected by one or more wireless sensors. The wireless controller further includes one or more wireless actuators for actuating and/or deactuating the energy devices. The wireless controller further includes a display device for visual communication, audio communication, and/or tactile communication.

[0022] In some examples, the wireless controller operates autonomously based on the one or more parts of the energy profile. The control module allows for manual user control of the wireless controller. The control module stores the one or more parts of the energy profile. The wireless controller routes and/or forwards communications via a wireless mesh network.

[0023] In other examples, the energy device is managed based on second energy data collected by one or more wireless sensors. The energy devices are actuated and/or deactuated by one or more wireless actuators. The wireless controller operates autonomously based on the one or more parts of the energy profile. The wireless controller stores the one or more parts of the energy profile.

[0024] In some examples, an alert is determined based on the one or more parts of the energy profile and/or the energy data. The energy device is managed based on the one or more parts of the energy profile and/or the energy data. The management of the energy device includes controlling, directing, and/or monitoring the energy device.

[0025] The energy management techniques described herein can provide one or more of the following advantages. An advantage to the energy management system is that the distribution of the management intelligence of the energy devices enables a cost-effective solution to energy management. Another advantage to the energy management system is that the wireless mesh network enables wireless controllers to be installed and put into service with minimal cost and disruption to existing facilities and operations (i.e., easy to retrofit into existing energy infrastructure). An additional advantage to the energy management system is that the deployment of wireless controllers and sensors enables the monitoring and analysis of energy devices which enables consumers to maximize the energy investment. Another advantage to the energy management system is that the wireless controllers and sensors can be rapidly established and operate in an extensive and universal multi-site management system across global sites by coupling the ease, minimal costs, and non-invasive nature of installation at each site with widely available communications infrastructure such as telecommunications and the internet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The foregoing and other objects, features and advantages will be apparent from the following more particular description of the embodiments, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the embodiments.

[0027] FIG. 1A depicts an overview of an exemplary energy management system.

[0028] FIG. 1B depicts an overview of another exemplary energy management system.

[0029] FIG. 2 is a diagram of an exemplary management server on a network.

[0030] FIG. 3 is a diagram of an exemplary wireless gateway, a wireless mesh network, and a network.

[0031] FIG. 4 is a diagram of an exemplary wireless controller managing energy devices and sensors.

[0032] FIG. 5 is a diagram of an exemplary wireless controller providing thermostat functions.

[0033] FIGS. 6A and 6B illustrate two examples of an energy profile.

[0034] FIG. 7 is a flowchart illustrating management of wireless controllers by a management server utilizing an energy profile and energy data.

[0035] FIG. 8 is a flowchart illustrating monitoring of wireless controllers and associated energy devices by a management server and

[0036] FIG. 9 is a flowchart illustrating management of energy devices by a wireless controller utilizing an energy profile and sensor data.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0037] Generally, the system and method for energy management is reducing the overall energy costs related to energy

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devices (e.g., air conditioners, lights, fans, etc.). The management of the energy devices can provide a cost-effective solution to energy management by maximizing the effective use of energy-producing devices (e.g., generators, windmills, solar panels, etc.) and minimizing energy use of energy-consuming devices (e.g., air conditioners, heaters, lights, etc.). The management of the energy devices can be performed jointly and independently by a management server and wireless controllers.

[0038] The management server and the wireless controllers jointly manage an energy profile (e.g., activate the lights at 8:00 am and turn off the lights at 5:00 pm, use solar power from 8:00 am to 12:00 pm, etc.) for the energy devices. The joint management of the energy profile can advantageously provide centralized management of the energy profile while still allowing individualized management of certain features (e.g., temperature ranges, temperature overrides, etc.). The wireless controllers can independently manage the energy devices based on the energy profile which advantageously allows the wireless controllers to operate based on the energy profile without interaction from the management server.

[0039] Additionally wireless controllers can be added to the energy management system with minimal effort and cost since the additionally wireless controllers can operate based on the established energy profile received from existing energy devices. For example, the management server manages an energy profile of an office complex. The wireless controllers for the lights in each office are added in the office complex as funding and time permits. As each wireless controller is added, the wireless controller manages the associated light based on the previously established energy profile (e.g., activate the lights at 8:00 am and turn off the lights at 6:00 pm). As such, the addition of the wireless controllers does not require significant administration time, but only requires the installation and wireless setup of the wireless controller.

[0040] Referring to FIG. 1A, an energy management system 50 is depicted. The energy management system 50 is associated with a building 51 or a series of buildings (e.g., a second building 51', an office complex, a school campus, global offices, commonly-owned buildings, commonly-managed buildings, etc.). The energy management system 50 includes the internet 52, a wireless gateway 53, a wireless repeater 54, a wireless controller A 55a, a wireless controller B 55b, a wireless actuator 57, a wireless sensor 58, and energy devices 59. The building 51 includes a plurality of rooms (e.g., room A 56a and room B 56b). The energy management system 50 is interconnected via a wireless mesh network. The wireless gateway 53 connects the wireless mesh network with a management server (not shown) via the internet 52. The wireless repeater 54 extends the range of the wireless mesh network by forwarding and/or routing communications between the wireless controllers 55a and 55b, the wireless sensor 58 and/or the wireless actuator 57. The wireless controllers A 55a and B 55b are associated with the rooms A 56a and B 56b, respectively. The wireless actuator 57 actuates and/or deactuates energy devices and/or any other type of device (e.g., mechanical device, electrical device, etc.). The wireless sensor 58 provides energy data to the wireless controllers A 55a and B 55b and/or the management server.

[0041] Each wireless controller A 55a and B 55b manages the energy devices 59 associated with the respective room based on an energy profile and/or energy data (e.g., environmental data, energy consumption data, energy generation

data, etc.). For example, the wireless controller A 55a directs the heating unit (i.e., one of the energy devices 59) to activate and heat the room A 56a. As part of the heating of the room A 56a, the wireless controller A 55a directs the wireless actuator 57 to actuate a baffle and a fan to force a limited amount of outside air into room A 56a.

[0042] In some embodiments, the wireless controllers A 55a and B 55b can communicate with each other via the wireless mesh network. For example, the wireless sensor 58 transmits temperature data to the wireless controller A 55a via wireless controller B 55b and the wireless mesh network. In other words, the wireless sensor 58 transmits the temperature data to the wireless controller A 55a via the wireless mesh network through the following devices: the wireless sensor 58, a first wireless repeater, wireless controller B 55b, a second wireless repeater, a third wireless repeater, and then the wireless controller A 55a.

[0043] In other embodiments, the wireless sensor 58 communicates with other safety and/or medical devices within and/or near the building. The other safety and/or medical devices can include a medical alert device, a security alert device, a communication device, and/or any other type of device associated with safety and/or medical needs of a building. For example, the wireless sensor 58 receives medical alerts from a medical alert device within and/or near the building 51. The wireless sensor 58 communicates the alert data to the management server and/or a wireless controller. The management server and/or the wireless controller 55 processes the alert data and notifies the appropriate personnel (e.g., police, fire, etc.). In some embodiments, the management server and/or the wireless controller 55 can communicate with the safety and/or medical device to notify the user regarding updated information (e.g., police are two minutes away, ambulance is in the building 51, etc.).

[0044] Although FIG. 1A illustrates the wireless controllers 55 associated with a room 56, the wireless controllers 55 can be associated with individual energy devices 59 and/or groups of energy devices 59. For example, room A 56a is a kitchen and includes a first wireless controller (not shown) associated with an oven (not shown), a second wireless controller (not shown) associated with a refrigerator (not shown), a third wireless controller (not shown) associated with lights in the kitchen, and the wireless controller A 55a associated with the heating unit. In other words, each room 56 can include a plurality of wireless controllers 55.

[0045] Referring to FIG. 1B, an energy management system 100 includes wireless controllers 110a, 110b, 110c, 110d, 110e, . . . 110n (generally 110) in a wireless mesh network 170. The energy management system 100 further includes a wireless repeater 118, a management server 120, a wireless gateway 130, a network 140, and a client module 150. In one embodiment, the wireless controller 110e manages (e.g., controls, directs, monitors, etc.) an energy device 160 (e.g., heater, air conditioner, lights, windmill, etc.). The wireless repeater 118 forwards and/or routes communications between wireless controller D 110d and wireless controller C 110c via the wireless mesh network thereby extending the range of the wireless mesh network 170. The wireless gateway 130 connects the wireless mesh network 170 to the management server 120 via the network 140. The management server 120 communicates with the wireless controllers 110 via the network 140 (e.g., the internet) and the wireless gateway 130 and transmits part or all of an energy profile to one or more of the wireless controllers 110. The management

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server 120 also receives energy data from the wireless controllers 110. The client module 150 includes an interface utilized to manage the management server 120 directly or remotely via the network 140.

[0046] The energy management system 100 can be, for example, utilized in a building and/or a group of buildings (e.g., campus, office complex, global office complex, city-wide campus, etc.). The energy management system 100 can be utilized in a retail store, an office, an educational facility (e.g., elementary school, school district, university, etc.), a healthcare facility (e.g., doctor's office, hospital, nursing home, etc.), a lodging facility (e.g., hotel, motel, etc.), a warehouse, a food service facility, an assembly facility, and/or any other type of building.

[0047] Each wireless controller 110 manages at least one energy device based on one or more parts of an energy profile. An advantage to the management of energy devices by the wireless controller 110 is that each individual wireless controller 110 can implement and enforce the appropriate energy management policy that can effectively manage energy consumption. In one embodiment, the wireless controller E 110e manages the energy device 160. The wireless controller E 110e can, for example, manage the energy device 160 directly by utilizing a wired connection (e.g., serial connection, ethernet connection, fiber optic connection, etc.) and/or wireless connection (e.g., wireless personal area network, cellular phone network, etc.) between the energy device 160 and the wireless controller E 110e. The wireless controller E 110e can, for example, monitor the energy device 160 indirectly by utilizing one or more sensors (not shown).

[0048] The wireless controller E 110e communicates the monitored energy data to the management server 120 via the wireless mesh network 170 and the network 140. The management server 120 manages one or more parts of an energy profile based on the energy data, preferences, and/or other information associated with the energy management system 100 (e.g., building holidays, occupancy variation, weather, power demands, etc.). The energy profile is utilized to distribute the intelligence of the energy management system 100 across the wireless controllers 110 and the management server 120. For example, each wireless controller 110 can independently and autonomously manage the energy device 160 based on the energy profile or parts thereof and/or the energy data. An advantage of distributing the intelligence allows for easy deployment and adoption of the energy management system 100 since both the wireless controller 110 and the management server 120 manage the energy policy compliance and optimization.

[0049] The management server 120 transmits part or all of the energy profile to each wireless controller 110. In some examples, the management server 120 transmits all of the energy profile to each wireless controller 110 to enable backups and/or redundancy between the wireless controller 110a, 110b, 110c, 110d, 110e, . . . , 110n. The storage of all of the energy profile by each wireless controller 110 enables the wireless controllers 110 to provide backups of the energy profile to the management server 120 and/or to other wireless controllers 110 not currently in communication on the wireless mesh network 170. One advantage to storing the profile on each wireless controller 110 is that each wireless controller 110 can independently operate using the energy profile whether or not the wireless controller 110 is in communication with the management server 120.

[0050] All of the energy profile can be, for example, transmitted to each wireless controller 110 to enable the wireless controllers 110 to provide backup management to the energy devices. For example, wireless controller F 110f is designed as the backup controller for the energy device 160. When wireless controller E 110e is not available as the primary controller for the energy device 160, then wireless controller F 110f acts as the primary controller for energy device 160 (e.g., via a wireless connection between the wireless controller F 110f and the energy device 160) when the wireless controller E 110e is within wireless range to the energy device 160.

[0051] The wireless controller E 110e manages the energy device 160 by utilizing at least one part of an energy profile associated with the energy device 160. For example, the wireless controller E 110e manages the energy device 160 (in this example, lights in an office complex). The wireless controller E 110e includes a part of the energy profile regarding the lights for the office complex (i.e., office lighting energy profile) is illustrated in Table 1.

TABLE 1

Example Office Lighting Energy Profile					
Mode	Start Time	End Time	Days	Lights	Time Delay
Occupied	8:00 am	5:30 pm	Weekdays	On	
Unoccupied	5:30 pm	1:00 am	Weekdays	Medium	5 minutes
Unoccupied			Weekends	Off	

The wireless controller E 110e manages the lights (i.e., the energy device 160) based on the office lighting energy profile stored by the wireless controller E 110e and actuates and deactuates the lights according to the office lighting energy profile.

[0052] As a further example, the wireless controller C 110c manages heating, ventilating, and air conditioning (HVAC) for the office complex. The wireless controller C 110c can manage the HVAC units for the office complex utilizing a wired connection, a wireless connection, and/or a pneumatic controlled connection. The wireless controller C 110c includes a different part of the energy profile for the office complex (i.e., office HVAC energy profile). The office HVAC energy profile includes information as illustrated in Table 2.

TABLE 2

Example Office HVAC Energy Profile					
Mode	Start Time	End Time	Days	Temperature	Range
Occupied	7:30 am	7:30 pm	Weekdays	70	±5
Occupied	8:00 am	5:30 pm	Weekdays	73	±5
Unoccupied	5:30 pm	8:30 pm	Weekdays	65	±5
Unoccupied			Weekend	65	±5

The wireless controller C 110c manages the heating, ventilating, and air conditioning units for the office complex based on the office HVAC energy profile (i.e., part of the energy profile for the office complex). In these examples, Tables 1 and 2 are parts of an energy profile for the office complex.

[0053] In some examples, the energy device 160 is an energy-consuming device, an energy-producing device, and/or any other type of energy device associated with energy. The energy-consuming device can be, for example, an air conditioner, a heater, a refrigerator, a light, a fan, an appliance (e.g.,

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an oven, a blender, etc.), a control device (e.g., pump control, shade control, etc.), and/or any other type of device that consumes energy. As another example, the energy-producing device can be, for example, a renewable energy source (e.g., a solar panel, a wind generator, etc.), a generator (e.g., a diesel generator, a propane generator, etc.), grid power, an energy-storing device (e.g., a battery, a hydrogen cell, etc.), and/or any other type of device that produces and/or stores energy.

[0054] In other examples, the wireless controllers 110 communicate with each other via the wireless mesh network 170. Each wireless controller 110 can receive communications from other wireless controllers 110 and route the communication to the wireless gateway 130. For example, the wireless controller E 110e transmits energy data associated with the energy consuming device 160 to the wireless controller C 110c. The wireless controller C 110c determines the best route (e.g., shortest number of transmission hops, lowest latency time for the transmission, etc.) for the transmission of the energy data and transmits the energy data to the wireless controller D 110d. The wireless controller C 110c can, for example, receive availability data (e.g., shortest number of transmission hops, lowest latency time, electrical power, etc.) regarding the wireless mesh network 170. The wireless controller D 110d determines the best route for the transmission of the energy data and transmits the energy data to the wireless gateway 130. The wireless mesh network 170 can, for example, include a wireless repeater for forwarding and/or routing communication over the wireless mesh network 170. The wireless gateway 130 transmits the energy data to the management server 120.

[0055] In some examples, the wireless controllers 110 is configured for other types of wired and/or wireless networks. More generally, the energy management system 100 can include any number of wireless controllers 110, and each wireless controller 110 can individually manage any number of energy devices 160.

[0056] In other examples, the client module 150 includes a web-based interface utilized to manage the management server 120 and/or the wireless controllers 110 via the network 140. A user and/or an administrator can, for example, access the client module 150 utilizing a transmitting device (e.g., laptop computer with a web browser) and remotely control the system 100. The user and/or the administrator can remotely control the system 100 by directly communicating with the wireless controls 110 or by communicating with the management server 120. The client module 150 can control access via various granular levels of access utilizing a username/password and/or any other type of authentication/authorization mechanism. For example, the user utilizing the client module 150 via the transmitting device can monitor current energy consumption conditions and the wireless mesh network 170 status. The user can also view historical trending charts and analysis reports created by the management server 120. As another example, the user, depending on their access level, can modify the energy profile (e.g., modify temperature set points for the modes and the schedules). Although FIG. 1B illustrates the client module 150 separate from the management server 120, the client module 150 can be integrated into the management server 120.

[0057] In some examples, the energy data includes energy consumption data, environmental data, energy generation data, and/or any other type of data associated with building management (e.g., direction of windows on the building, prevailing wind, insulation type, oil tank level, propane tank

level, alert information, etc.). The energy consumption data can include, for example, energy used by the energy device 160, energy saved by the energy device 160, further energy use by the energy device 160, proposed energy use by the energy device 160, cost of different types of energy, and/or any other type of data associated with the consumption of energy. The environmental data can include, for example, outside temperature, inside temperature, outside humidity, inside humidity, rainfall, sunlight coverage, environmental costs of different types of energy (e.g., cost of one kilowatt of wind power, greenhouse gas emissions for one kilowatt of coal power, etc.), and/or any other data associated with the environment. The energy generation data can include, for example, alternative energy generation level (e.g., solar power generation, wind power generation, etc.), grid power level, and/or any other type of data associated with energy generation.

[0058] Although FIG. 1B illustrates communication between the wireless mesh network and the management server via a wireless gateway and a network, the management server 120 can be, for example, connected to the wireless mesh network 170. For example, the management server 120 in the energy management system 100 for a residential house can be situated in the house and can be directly connected to a wireless mesh network 170 of wireless controllers 110 located in the house.

[0059] Although FIG. 1B illustrates a single wireless mesh network of wireless controllers 110, a single wireless gateway 130, and a single management server 120, the energy management system 100 can include any number of wireless controllers 110, management servers 120, wireless gateways 130, and/or wireless mesh networks 170 of wireless controllers 110. For example, an energy management system 100 servicing several office buildings includes a separate wireless mesh network of wireless controllers for each office building, a separate wireless gateway for each wireless mesh network, and a single management server managing all of the wireless controllers.

[0060] Referring to FIG. 2, an energy management system 200 includes a management server 220, a network 140, a wireless gateway 130, and a wireless controller 210 configured in a wireless mesh network 270. The management server 220 communicates via the network 140 to the wireless gateway 130. The management server 220 includes a communication module 222, a profile module 224, an analysis module 226, and a storage module 228. The communication module 222 monitors and receives energy data from the wireless controller 210 via the wireless gateway 130 and the network 140. The profile module 224 manages the energy profile and transmits part or all of the energy profile to the wireless controller 210 via the network 140 and the wireless gateway 130. The analysis module 226 analyzes the energy data received by the communication module 222 and creates modifications to the energy profile managed by the profile module 224. The storage module 228 stores the energy data, the modifications to the energy profile, and/or the energy profile.

[0061] The communication module 222 receives energy data from the wireless controller 210. Table 3 illustrates exemplary energy data for lighting of the office complex by the wireless controller 110c of FIG. 1B utilizing the energy profile illustrated in Table 1.

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TABLE 3

Exemplary Energy Data for Lighting				
Action	Time	Day	Mode	Time
Unoccupied		Sunday	Unoccupied	
Motion	7:00 am	Monday	Unoccupied	30 minutes
Occupied	8:00 am	Monday	Occupied	
Unoccupied	5:00 pm	Monday	Unoccupied	
Motion	6:00 am	Tuesday	Unoccupied	30 minutes
Occupied	8:00 am	Tuesday	Occupied	
Unoccupied	5:00 pm	Tuesday	Unoccupied	
Motion	7:00 am	Wednesday	Unoccupied	40 minutes
Occupied	8:00 am	Wednesday	Occupied	
Unoccupied	5:00 pm	Wednesday	Unoccupied	
Motion	7:00 am	Thursday	Unoccupied	38 minutes
Occupied	8:00 am	Thursday	Occupied	
Unoccupied	5:00 pm	Thursday	Unoccupied	
Occupied	8:00 am	Friday	Occupied	
Unoccupied	5:00 pm	Friday	Unoccupied	

Table 4 illustrates exemplary energy data for HVAC of the office complex by the wireless controller 110b of FIG. 1B utilizing the energy profile illustrated in Table 2.

TABLE 4

Exemplary Energy Data for HVAC					
Action	Time	Day	Mode	Time	Temperature
Unoccupied		Sunday	Unoccupied		65
Ramp-Up	7:00 am	Monday	Ramp-Up		65
Override	7:00 am	Monday	Ramp-Up	30 minutes	70
Occupied	8:00 am	Monday	Occupied		70
Unoccupied	5:00 pm	Monday	Unoccupied		65
Override	6:00 am	Tuesday	Unoccupied	40 minutes	70
Ramp-Up	7:00 am	Tuesday	Ramp-Up		70
Override	7:00 am	Tuesday	Ramp-Up		70
Occupied	8:00 am	Tuesday	Occupied		70
Unoccupied	5:00 pm	Tuesday	Unoccupied		65
Ramp-Up	7:00 am	Wednesday	Ramp-Up		70
Override	7:00 am	Wednesday	Ramp-Up	40 minutes	70
Occupied	8:00 am	Wednesday	Occupied		70
Unoccupied	5:00 pm	Wednesday	Unoccupied		65
Ramp-Up	7:00 am	Thursday	Ramp-Up		70
Override	7:00 am	Thursday	Ramp-Up	38 minutes	70
Occupied	8:00 am	Thursday	Occupied		70
Unoccupied	5:00 pm	Thursday	Unoccupied		65
Ramp-Up	7:00 am	Thursday	Ramp-Up		70
Occupied	8:00 am	Thursday	Occupied		70
Override	6:00 am	Thursday	Unoccupied	1:00 minutes	68
Unoccupied	5:00 pm	Thursday	Unoccupied		65

[0062] The communication module 222 can receive, for example, any type of energy data from energy devices and/or sensors. For example, the communication module 222 receives energy data associated with humidity of the office complex from one or more humidity sensors (not shown) in the office complex.

[0063] The analysis module 226 analyzes the energy data received by the communication module 222 (e.g., illustrated in Tables 3 and 4). The analysis module 226 creates modifications to the energy profile managed by the profile module 224. For example, the analysis module 226 analyzes the energy data in Table 3 and determines that on Monday, Tuesday, Wednesday, and Thursday, the lighting is controlled via the motion detector for approximately one hour before the Occupied mode is activated. Based on the energy data, the

analysis module 226 creates modifications to the energy profile (in this example, modified start time for Occupied mode and modified end time for Unoccupied mode). The analysis module 226 communicates the modifications of the energy profile to the profile module 224.

[0064] The profile module 224 makes the modifications to the energy profile. As a further example, Table 5 illustrates the modified energy profile for the office lighting. The energy profile 224 transmits the modified office lighting energy profile to the wireless controller E 110e via the network 140 and the wireless gateway 130.

TABLE 5

Exemplary Modified Office Lighting Energy Profile					
Mode	Start Time	End Time	Days	Light	Time Delay
Occupied	7:00 am	5:00 pm	Weekdays	On	
Unoccupied	5:00 pm	6:30 am	Weekdays	Motion	5 minutes
Unoccupied			Weekends	Off	

The wireless controller E 110e manages the lights (i.e., the energy device 160) based on the modified office lighting

energy profile stored by the wireless controller E 110e and activities and deactivates the lights according to the modified office lighting energy profile.

[0065] As a further example, the analysis module 226 analyzes the energy data in Table 4 and determines that on Monday, Tuesday, Wednesday, and Thursday, the HVAC system is turned on via an override button for approximately one hour before the Occupied mode is activated. Based on the energy data, the analysis module 226 creates modifications to the energy profile (in this example, modified start time for Occupied and Ramp-up mode and modified end time for Unoccupied mode). The analysis module 226 communicates the modifications of the energy profile to the profile module 224. The profile module 224 makes the modifications to the energy profile. As a further example, Table 6 illustrates the modified

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energy profile for the office HVAC. The energy profile 224 transmits the modified office HVAC energy profile to the wireless controller 110d via the network 140 and the wireless gateway 130.

TABLE 6

<i>Example Modified Office HVAC Energy Profile</i>					
Mode	Start Time	End Time	Days	Temperature	Range
Ramp-Up	6:00 am	6:50 am	Weekdays	75°	a3
Occupied	7:00 am	5:00 pm	Weekdays	73°	a3
Unoccupied	5:00 pm	8:00 am	Weekdays	65°	a3
Unoccupied			Weekend	65°	a3

[0066] In some examples, the analysis module 226 accesses energy data (e.g., current energy consumption data, past energy consumption data, environmental data, etc.) stored on the storage module 228 to create charts and/or reports regarding past, present, and/or future energy use for the system 200. The charts and/or reports can include, for example, a future energy savings chart/report (e.g., how much will be saved by the energy management system 200, how much can be saved by switching from a HVAC unit to another HVAC unit, etc.), a present energy chart/report (e.g., present use of alternative energy generation, present energy use of lights, etc.), a past energy chart/report (e.g., past use of alternative energy generation, past energy use of HVAC units, past indoor and outdoor temperatures, etc.) and/or any other type of chart/report associated with the energy management system 200 (e.g., use of energy by a type of energy device at one building compares to the use of energy of the same energy device at other buildings, energy devices operating at or below optimal efficiency, etc.).

[0067] For example, the analysis module 226 creates a energy report for the current inputted by the HVAC unit versus the average temperature outside of the building as recorded by a temperature sensor over the course of the past ten years. As another example, the analysis module 226 creates a time chart for the time between when the Occupied mode is activated until when individual rooms in a zone (e.g., all of the classrooms in a building) reach the set temperature. The time chart can be utilized by the analysis module 226 to modify the energy profile and/or can be utilized by the administrator to determine if the energy unit (e.g., HVAC unit) is underperforming, requires maintenance, and/or if any other issues exist for the rooms. As another example, the analysis module 226 creates a energy savings report based on past indoor and outdoor temperatures. The energy savings report can include, for example, the energy saved by the energy management system 200 (e.g., 15% of heating energy was saved due to the energy management system 200 during the last two months; 25% of cooling energy was saved last quarter by optimized temperature ranges, etc.).

[0068] As another example, the analysis module 226 is configured to detect sudden decreases in temperature in a room (e.g., five degrees within ten minutes, ten degrees within twenty minutes, etc.). When sudden decreases in temperature in a room are detected, the analysis module 226 can alert the administrator and/or security personnel since the sudden decrease in temperature may indicate a security event (e.g., open window or door).

[0069] As a further example, the analysis module 226 evaluates override requests to determine if the energy profile of a room is not meeting the user demands. For example, if the

user is constantly overriding the energy profile every morning to decrease the temperature, then the energy profile could be adjusted to fit the user's desired temperature. However, if the user's desired temperature is below the minimum threshold (e.g., 65 degrees, 75 degrees, etc.) set by building management, then the analysis module 226 will not modify the energy profile below the minimum threshold set by the building management. In other embodiments, the modification of the energy profile based on the user's desired temperature needs approval by authorized personnel.

[0070] In other examples, the storage module 228 stores the energy data, the modifications to the energy profile, and/or the energy profile utilizing a database. For example, the storage module 228 stores the energy data, the modification to the energy profile, and/or the energy profile in a secured SQL database. The database can be, for example, accessed by the client module 150 and/or the management server 220. In other embodiments, the storage module 228 can be located remotely from the management server 220.

[0071] Referring to FIG. 3, an energy management system 300 includes the management server 120, the network 140, a wireless gateway 330, and the wireless controller 210 in the wireless mesh network 270. The wireless gateway 330 provides for communication between the network 140 and the wireless mesh network 270 (e.g., protocol conversion, communication packet forwarding and/or routing, etc.). The wireless gateway 330 includes a wireless network module 332 and a management network module 334.

[0072] The management server 120 transmits one or more parts of an energy profile via the network 140 to the management network module 332. The management network module 332 processes the one or more parts of the energy profile (e.g., stores the parts, identifies the recipient of the parts, etc.) and communicates the parts of the energy profile to the wireless network module 334 which transmits the parts of the energy profile to the wireless controllers 210. The wireless network module 334 receives energy data transmitted by the wireless controllers 210 via the wireless mesh network 170. The wireless network module 334 processes the energy data (e.g., stores the energy data, identifies the recipient of the energy data, etc.) and communicates the energy data to the management network module 332. The management network module 332 transmits the energy data via the network 140 to the management server 120.

[0073] In some examples, the wireless gateway 330 stores the one or more parts of the energy profile and/or the energy data in a storage module (not shown). The wireless gateway 330 can be, for example, utilized as the centralized storage of the energy profile and/or the energy data.

[0074] Referring to FIG. 4, an energy management system 400 includes a wireless controller 410, a wireless mesh network 470, the wireless gateway 130, an air conditioning unit 460, a humidifier/de-humidifier unit 462, a temperature sensor 466, a humidity sensor 468, and a haffle actuator 469. In some embodiments, the temperature sensor 466 and the humidity sensor 468 can be included in the wireless controller 410. In other embodiments, the haffle actuator 469 can be included in the wireless controller 410. The wireless controller 410 includes a display module 412, a control module 414, and a network interface module 416. The wireless gateway 130 communicates with the wireless controller 410 via the wireless mesh network 470.

[0075] The air conditioning unit 460, the humidifier/de-humidifier unit 462, the temperature sensor 466, and the

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humidity sensor 468 communicate with the control module 414. The control module 414 receives the energy data from the air conditioner unit 460 and the humidifier/de-humidifier unit 462 and transmits the energy data utilizing the network interface 416 via the wireless mesh network 470 to the wireless gateway 130. The control module 414 also receives temperature data from the temperature sensor 466 and humidity data from the humidity sensor 468 and transmits the temperature data and the humidity data utilizing the network interface 416 via wireless mesh network 470 to the wireless gateway 130.

[0076] The network interface module 416 receives part or all of an energy profile via the wireless mesh network 470 from the wireless gateway 130. The part or all of the energy profile is communicated from the network interface module 416 to the control module 414. The control module 414 manages the air conditioner unit 460 and the humidifier/de-humidifier unit 462 based on part or all of the energy profile and/or on data received from temperature sensor 466 and humidity sensor 468. The display device 412 provides visual (e.g., flashing lights, color, intensity, text, graphics, etc.), audio (e.g., bells, tones, tunes, voice, etc.), and/or tactile communication to users of the wireless controller 410. In other embodiments, the display device 412 provides advertisements, local information (e.g., town meetings, baseball game information, etc.), national information, and/or any other type of information communicated by a visual, audio, and/or tactile communication.

[0077] The control module 414 manages the baffle actuator 469. The baffle actuator 469 can activate and/or deactivate a baffle in the energy management system 400. In other embodiments, the control module 414 manages one or more wireless actuators (not shown). The wireless actuators can, for example, activate and/or deactivate the energy devices (e.g., ventilation devices, fans, baffles, gates, etc.).

[0078] In some examples, the control module 414 determines the cost of utilizing the air conditioning unit 460 based on the energy costs of the energy source (e.g., line power). The control module 414 can utilize the display device 412 to communicate the energy costs to the user. For example, the user requests the control module 414 to decrease the temperature from 68° to 66°. The control module 414 further queries the user to ensure that the user desires to decrease the temperature based on the energy costs (e.g., ten dollars per day, etc.) and/or environmental costs (e.g., four pounds of carbon dioxide produced, etc.). In other words, the control module 414 requires the user to confirm the request for the energy device after communicating the energy costs and/or environmental costs of the user's request.

[0079] In other examples, the temperature sensor 466 and/or the humidity sensor 468 are wireless and configured to send data to wireless controller 414 and/or the management server 120 via the wireless mesh network 470. The temperature sensor 466 and/or the humidity sensor 468 can be utilized as the control for the air conditioning unit 460 and/or the humidifier/de-humidifier unit 462. In other examples, the temperature sensor 466 and/or the humidity sensor 468 are utilized to record and/or analyze data regarding the building and/or the environment. For example, the temperature sensor 466 is placed outside of the building to determine the outside temperature so that the energy profile can be modified based on the weather. The sensor 466 or 468 can be battery-powered and configured to minimize power usage. An advantage to utilizing self-sufficient sensors is that the sensors can be

easily placed by users/administrators to monitor changing conditions (e.g., extra temperature sensor in computer server room during a HVAC unit maintenance period, heat sensor in office suite while the office suite is under renovations).

[0080] In some examples, the wireless controller 410 has occasional and/or sporadic communication with the management server 120 via the wireless mesh network 470. The control module 414 can advantageously execute the parts of the energy profile associated with the wireless controller 410 and/or can modify the parts of the energy profile associated with the wireless controller 410 which enables the wireless controller 410 to operate autonomously from the management server 120 and/or other wireless controllers 110.

[0081] In other examples, the wireless controller 410 can send alerts directly to administration and/or users based on the parts of the energy profile. For example, when the temperature drops below the alert level (in this example, temperature is 65 degrees and the alert level is 70 degrees), then the wireless controller 410 transmits an alert to the administrator's pager (not shown) via the wireless mesh network 470.

[0082] In some examples, the wireless controller 410 can be utilized as a wireless mesh network repeater. In other words, the wireless controller 410 can be utilized to extend the range of the wireless mesh network 470 and allow for communication with wireless controllers 110 throughout a building and/or campus.

[0083] Although FIG. 4 illustrates the temperature sensor 466 and the humidity sensor 468, the energy management system 400 can include any type of sensor and/or alarm. The sensor can include a flow meter (e.g., water meter, gas meter, etc.), a power meter, a current meter, a battery meter, a pulse meter (e.g., network pulse, a human/animal pulse, etc.), a input/output node (e.g., monitor analog input/output, monitor digital input/output, etc.), a light sensor, a motion detector, a proximity sensor, a pressure sensor, a carbon dioxide sensor, a carbon monoxide sensor, a heat sensor, a network sensor, and/or any other type of sensor. The sensor can measure the environmental level of the particles of the materials and/or gases. The alarm can include an audible alarm, a flashing alarm, an automated telephone alert, an email alert, and/or any other type of alarm.

[0084] For example, the energy management system 400 can include smoke sensors throughout an office complex which communicate with the wireless controller 410 for a fan for the office complex. As part of the fire alert protocol in the energy profile, the wireless controller 410 activates the fan at high speed when the smoke sensor detects smoke in a stairwell of the office complex. However, as part of the fire alert protocol in the energy profile, the wireless controller 410 activates the fan at low speed when the smoke sensor detects smoke in a bathroom of the office complex. In both cases of smoke detection, the energy management system 400 alerts an administration via the alert mechanisms (in this example, audible alarm, flashing alarm, and automated telephone alert).

[0085] FIG. 5 shows an example of a wireless controller 510 providing thermostat functions. The wireless controller 510 includes a display device 512, a temperature user control 517a, a humidity user control 517b, a setting user control 517c, and an override user control 517d. A user can adjust the temperature and humidity levels of the room serviced by wireless controller 510 via the temperature user control 517a and the humidity user control 517b, respectively, within the limits of all or part of the energy profile. The user can override

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the settings as defined by the energy profile by utilizing the override user control 517d. The override user control 517d can be used to temporarily (e.g., sixty minutes, one day, etc.) override the mode settings. The user can also save the updated setting and/or request that the updated setting be saved by utilizing the setting user control 517c. An advantage of utilizing the user controls is that the energy management system 100 is easy to use and is similar to existing user controls for energy systems and thus more efficient to use and learn by the user (i.e., better user compliance for energy management). It should be noted that existing thermostat devices can be utilized in conjunction with the wireless controller 510 to reduce the cost of retrofitting the energy management system 500.

[0086] For example, the wireless controller 510 is utilizing the HVAC energy profile as illustrated in Table 2 to manage the operation of a HVAC unit. As illustrated by the display device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON). As illustrated by the display device 512, the next mode change is at 5:01 pm (in this example, the mode change is from Occupied to Unoccupied). The user can override the Occupied mode setting by adjusting the temperature utilizing the temperature user control 517a. As illustrated in Table 3, at 7:00 am on Tuesday morning, the user overrode the Ramp-Up mode setting and increased the temperature from 70 degrees to 73 degrees. In addition, the redundant connection oriented design of the wireless mesh network 170 is illustrated in the display device 512 via the wireless communication with three other wireless controllers and one wireless gateway (e.g., wireless controller D 110d of FIG. 1B).

[0087] In some examples, the wireless controller 510 can display other types of information. For example, the wireless controller 510 can display time, weather forecasts, announcements (e.g., school announcements, business announcements), advertisements, and/or any other type of information that can be displayed to a building, a zone, and/or any other delineation of the wireless controller 110. As another example, the wireless controller 510 can be utilized to display the time and receive time updates from a centralized time server (not shown).

[0088] FIG. 6A illustrates an example of parts of an energy profile 600a. The energy profile 600a includes two parts 610a and 620a. Part 610a includes parameters governing the autonomous behavior of a wireless controller servicing several offices. Because the offices are generally vacant during non-business hours, part 610a includes one set of parameters during the work day (in this example, 8:00 am to 5:00 pm) and another set of parameters at night (in this example, 5:01 pm to 7:59 am) to conserve energy. Part 620a includes parameters governing the autonomous behavior of a wireless controller servicing a computer server room. Because computer server rooms require careful constant temperature and humidity management, part 620a includes stricter parameters than part 610a. Part 620a also specifies that an administrator is alerted if environmental conditions within the computer server room rise above specified thresholds so that the user can respond appropriately.

[0089] FIG. 6B shows another example of the energy profile 600b. The energy profile 600b is a modified version of the energy profile 600a of FIG. 6A. The analysis module 226 of FIG. 2 determined the modifications for the energy profile 600a and communicated the modifications to the profile module 224. The profile module 224 modified the energy profile

600a to the modified energy profile 600b based on energy data associated with the energy device (in this example, HVAC unit), weather parameters (e.g., average temperature, average humidity, average rainfall, average sunshine, etc.) and/or preferences by the building management (e.g., maximum temperature, minimum temperature, etc.).

[0090] The profile module 224 modified the part 610a of the energy profile 600a associated with the wireless controller A to form the part 610b of the energy profile 600b. The modifications to the Occupied mode include changing the start time and the temperature change time. These modifications to the Occupied time were made by the analysis module 226 in response to changes in the weather parameters (in this example, daylight savings time). Accordingly, the Unoccupied mode was similarly modified to correctly correlate the start and end times for the seventeenth floor offices.

[0091] Additionally, the profile module 224 modifies the part 620a of the energy profile 600a associated with the wireless controller B to form the part 620b of the energy profile 600b. The modifications to the High Demand Occupied mode include changing the notification parameters. These modifications to the High Demand Occupied mode were made by the analysis module 226 in response to changes to the preferences by the building management. In other words, the building management needed earlier notifications when the computer server room was not near the set temperature and humidity settings (in this example, 60 degrees and 25% humidity).

[0092] The energy profile 600a or 600b can include any number of parts. In some examples, the management server 120 of FIG. 1B can manage multiple energy profiles. For example, an energy management system 100 servicing several schools in different geographic locations can have one management server 120 managing a separate energy profile for each school. As another example, the management server 120 can manage a single energy profile for all of the elementary schools in a school district since all of the elementary schools have similar energy needs (e.g., start time, end time, temperature, override capabilities, etc.).

[0093] FIGS. 6A and 6B illustrate that different parts of the same building can have different settings, and/or modes. In other words, the same building can have different zones for temperature, lights, sensors, and/or other type of energy device managed by the energy management system 100. For example, Table 7 illustrates the use of different zones and modes for buildings.

TABLE 7

Example Communication Profile				
Mode	Zone	Setting	Day	Time
Occupied	All Classrooms	Lights-On	Weekdays	8:00 to 11:00
Unoccupied	All Classroom	Lights-Off	Weekdays	11:01 to 1:00
Occupied	East Classroom	HVAC-73	Weekdays	7:00 to 12:00
Unoccupied	East Classroom	HVAC-68	Weekdays	12:01 to 6:59
Occupied	West Classroom	HVAC-70	Weekdays	7:00 to 12:00
Unoccupied	West Classroom	HVAC-70	Weekdays	12:01 to 7:59

[0094] In some examples, the energy profile 600a or 600b is created and/or modified utilizing a scheduling structure utilizing a time period (e.g., fifteen minute increments, one

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hour increments, etc.). The scheduling structure can be hierarchical with a plurality of structures (e.g., default schedule, vacation schedule, special event schedule, etc.). The scheduling structure can include a default schedule with normal business hours (e.g., Monday through Friday from 8:00 am to 5:00 pm, seven days a week from 10:00 am to 10:00 pm, etc.). An advantage to the default schedule is that the default schedule enables uniform and generic modifications to be made to the energy profile. For example, the start time for normal business hours is modified from 10:00 am to 11:00 am.

[0095] It should be understood that various rooms (e.g., computer rooms) can retain their own energy profile regardless of the vacation schedule. The scheduling structure can include, for example, a vacation schedule that can apply to all zones (e.g., rooms) of a building or set of buildings and/or to a set of zones (e.g., West Classrooms) of a building or set of buildings. For example, a building/school holiday is Monday, July 4. The holiday, July 4, is scheduled to set All Classrooms to Unoccupied mode for Monday, July 4. As another example,

top floor, 47th floor of the office complex is scheduled to have a party on Saturday, December 25. As such, a special event is scheduled for the 47th floor for Saturday, December 25. The special event can be utilized to override the default schedule and the vacation schedule.

[0097] In other examples, the energy profile utilizes different operational modes to optimize the energy use under certain conditions. For example, as illustrated in Table 7 above, the classrooms have an Occupied mode and an Unoccupied mode. When the lights are in Occupied mode, then the lights are on and when the lights are in Unoccupied mode, then the lights are off. The automatic and uniform application of the mode utilizing the energy profile advantageously enables the optimal regulation of energy consumption under particular conditions in order to minimize waste. Table 8 illustrates different operational modes in the context of a HVAC unit. Although Table 8 illustrates the different operational modes in the context of a HVAC unit, the different operational modes can be utilized for any type of energy device.

TABLE 8

Exemplary Operational Modes				
Mode	Description	Temperature	Range	Triggers
Occupied	Full occupancy	Energy profile control of heat/thermostat	Set point comfort range (e.g., 67 degrees)	Schedule, occupancy sensors or exit of
Unoccupied	Empty	Local thermostat (disabled)	Fixed/locked	Override mode, Schedule or occupancy sensors
Override	Manual control	Local thermostat with change profile	Water comfort range (e.g., 65-69 degrees)	Override button
Maintenance	Manual control	Local thermostat with no limit	Maintenance comfort range (e.g., 55-75 degrees)	Override button
Load and Response	Full occupancy during peak energy consumption	Energy profile control	Fixed/locked	Energy requirements from the electrical grid
Optimal Generation Source Transition	Energy source availability HVAC	Energy profile or none	Dependent on generation source	Energy source availability
		Energy profile control and/or other factors	Not applicable	Schedule, outside temperature, weather forecast, and/or historical data

the renters in the offices on the 23rd floor have a vacation scheduled for Friday, December 24. However, the renters in the office on the 22nd floor do not have a vacation schedule for Friday, December 24. As such, the holiday, December 24, is scheduled for the zone of offices on the 23rd floor and not the zone of offices on the 22nd floor.

[0096] The scheduling structure can include, for examples, a special events schedule that can apply to all zones of a building or set of buildings and/or to a set of zones of a building or set of buildings. For examples, the special events schedule can be utilized to override the default schedule and/or the vacation schedule. For example, the entire office complex is scheduled to be in Unoccupied mode on Saturday, December 25, since Saturday is outside of the normal business hours based on the default schedule and since December 25 is a holiday based on the vacation schedule. However, the

The operational modes can be utilized for any type of energy device to allow for the operation of the energy device. For example, in the demand response mode, the energy profile for the lighting can be configured to turn off half of the lighting in a grocery store to conserve energy consumption. As another example, in optimal generation mode, the wireless controller controlling the energy producing devices (e.g., electrical grid power, wind generator, etc.) changes the input power to the system 100 based on the current sensor data that a cheaper energy producing device is available (in this example, change the energy producing device from electrical grid power to the wind generator).

[0098] FIG. 7 is a flowchart 700 illustrating management of wireless controllers 210 by a management server 220 utilizing an energy profile and energy data as illustrated by FIG. 2. The communication module 222 of the management server

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220 receives (710) energy data from the wireless controller 210 via the wireless mesh network 270, the wireless gateway 136, and the network 140. The analysis module 226 analyzes (720) the energy data and determines (730) if any modifications are needed for the energy profile. If energy profile modifications are not needed, then the communication module 222 continues receiving (710) energy data from the wireless controller 210.

[0099] If energy profile modifications are needed, then the analysis module 226 communicates the modifications to the profile module 224. The profile module 224 modifies (740) the energy profile based on the modifications to the energy profile and/or other parameters (e.g., weather information, user preferences, building preferences, etc.). The profile module 224 transmits (750) the modified energy profile to the wireless controller 210 and the communication module 222 continues to receive (710) energy data.

[0100] FIG. 8 is a flowchart 800 illustrating monitoring of wireless controllers 110 and associated energy devices by a management server 120 as illustrated by FIG. 1B. The management server 120 receives (810) energy data from one or more wireless controllers 110. The management server 120 monitors (820) the energy devices (e.g., 160) utilizing the energy data. If the management server 120 determines (830) that any alerts are needed, then the management server 120 alerts (840) an administrator and continues to receive (810) energy data. If the management server 120 determines (830) that no alerts are needed, then the management server 120 continues to receive (810) energy data.

[0101] For example, the wireless controller F 110 is managing a HVAC unit for the Computer Server Room. The wireless controller F is utilizing the part 620b of the energy profile 600b. The notification as illustrated in the part 620b is that an alert occurs if the temperature is greater than 62 degrees or if the humidity is greater than 30%. The management module 120 receives (810) energy data from the wireless controller F 110. The management module 120 monitors (820) the HVAC unit utilizing the energy data. In this example, the energy data is 4:32 pm on Tuesday; temperature=65; humidity=29. The management module 120 determines (830) that an alert is needed based on the energy data (in this example, temperature is greater than 62 degrees) and alerts (840) via the appropriate alert mechanism (in this example, flashing light on the administrator's computer console and an automated email to the computer administrator).

[0102] FIG. 9 is a flowchart 900 illustrating management and monitoring of energy devices 460 and 462 by a wireless controller 410 utilizing an energy profile and sensor data as illustrated by FIG. 4. The network interface module 416 receives (910) energy profile modifications from the management server 120 of FIG. 1B and communicates the energy profile modifications to the control module 414. The control module 414 receives (920) sensor data from the temperature sensor 466 and the humidity sensor 468. The control module 414 manages (930) the energy devices (in this example, the air conditioning unit 460 and the humidity/de-humidifier unit 462) based on the energy profile and/or the sensor data. The control module 414 receives (940) energy data from the energy devices 460 and 462 and sensor data from the sensors 466 and 468 and transmits (950) the energy data and the sensor data to the management server 120 via the network interface module 416. The network interface module 416 continues to receive (910) energy profile modifications from the management server 120.

[0103] Although the management server 120 of FIG. 1B and the client module 150 is described as analyzing the energy data and/or creating the reports regarding the energy data, each wireless controller 110 can analyze the energy data and/or create reports regarding the energy data. For example, the wireless controller F 110 can analyze energy consumption for HVAC unit associated with the computer server room and display on the display device 512 a report that the HVAC unit has maintained the set temperature within the temperature range for a percentage of the time (in this example, HVAC unit performance 98%).

[0104] The above-described systems and methods can be implemented in digital electronic circuitry, in computer hardware, firmware, and/or software. The implementation can be as a computer program product. The implementation can, for example, be in a machine-readable storage device, for execution by, or to control the operation of, data processing apparatus. The implementation can, for example, be a programmatic processor, a computer, and/or multiple computers.

[0105] A computer program can be written in any form of programming language, including compiled and/or interpreted languages, and the computer program can be deployed in any form, including as a stand-alone program or as a subroutine, element, and/or other unit suitable for use in a computing environment. A computer program can be deployed to be executed on one computer or on multiple computers at one site.

[0106] Method steps can be performed by one or more programmable processors executing a computer program to perform functions of the invention by operating on input data and generating output. Method steps can also be performed by and an apparatus can be implemented as special purpose logic circuitry. The circuitry can, for example, be a FPGA (field programmable gate array) and/or an ASIC (application specific integrated circuit). Modules, subroutines, and software agents can refer to portions of the computer program, the processor, the special circuitry, software, and/or hardware that implements that functionality.

[0107] Processors suitable for the execution of a computer program include, by way of example, both general and special purpose microprocessors, and any one or more processors of any kind of digital computer. Generally, a processor receives instructions and data from a read-only memory or a random access memory or both. The essential elements of a computer are a processor for executing instructions and one or more memory devices for storing instructions and data. Generally, a computer can include, can be operatively coupled to receive data from and/or transfer data to one or more mass storage devices for storing data (e.g., magnetic, magneto-optical disks, or optical disks).

[0108] Data transmission and instructions can also occur over a communications network. Information carriers suitable for embodying computer program instructions and data include all forms of non-volatile memory, including by way of example semiconductor memory devices. The information carriers can, for example, be EPROM, EEPROM, flash memory devices, magnetic disks, internal hard disks, removable disks, magneto-optical disks, CD-ROM, and/or DVD-ROM disks. The processor and the memory can be supplemented by, and/or incorporated in, special purpose logic circuitry.

[0109] To provide for interaction with a user, the above-described techniques can be implemented on a computer having a display device. The display device can, for example,

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be a cathode ray tube (CRT) and/or a liquid crystal display (LCD) monitor. The interaction with a user can, for example, be a display of information to the user and a keyboard and a pointing device (e.g., a mouse or a trackball) by which the user can provide input to the computer (e.g., internet with a user interface element). Other kinds of devices can be used to provide for interaction with a user. Other devices can, for example, be communication provided to the user in any form of sensory feedback (e.g., visual feedback, auditory feedback, or tactile feedback). Input from the user can, for example, be received in any form, including text, acoustic, speech, and/or tactile input.

[0110] The above described techniques can be implemented in a distributed computing system that includes a back-end component. The back-end component can, for example, be a data server, a middleware component, and/or an application server. The above described techniques can be implemented in a distributing computing system that includes a front-end component. The front-end component can, for example, be a client computer having a graphical user interface, a Web browser through which a user can interact with an example implementation, and/or other graphical user interfaces for a transmitting device. The components of the system can be interconnected by any form or medium of digital data communication (e.g., a communication network).

[0111] The system can include clients and servers. A client and a server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

[0112] Examples of communication networks include wired networks, wireless networks, packet-based networks, and/or circuit-based networks. Packet-based networks can include, for example, the Internet, a carrier internet protocol (IP) network (e.g., local area network (LAN), wide area network (WAN), campus area network (CAN), metropolitan area network (MAN), home area network (HAN)), a private IP network, an IP private branch exchange (IPBX), a wireless network (e.g., radio access network (RAN), 802.11 network, 802.16 network, general packet radio service (GPRS) network, HiperLAN), and/or other packet-based networks. Circuit-based networks can include, for example, the public switched telephone network (PSTN), a private branch exchange (PBX), a wireless network (e.g., RAN, Bluetooth, code-division multiple access (CDMA) network, time division multiple access (TDMA) network, global system for mobile communications (GSM) network), and/or other circuit-based networks.

[0113] The transmitting device can include, for example, a computer with a browser device, a telephone, an IP phone, a mobile device (e.g., cellular phone, personal digital assistant (PDA) device, laptop computer, electronic mail device), and/or other communication devices. The browser device includes, for example, a computer (e.g., desktop computer, laptop computer) with a world wide web browser (e.g., Microsoft® Internet Explorer® available from Microsoft Corporation, Mozilla® Firefox available from Mozilla Corporation). The mobile computing device includes, for example, a personal digital assistant (PDA).

[0114] Comprise, include, and/or plural forms of each are open ended and include the listed parts and can include addi-

tional parts that are not listed. And/or is open ended and includes one or more of the listed parts and combinations of the listed parts.

[0115] One skilled in the art will realize the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The foregoing embodiments are therefore to be considered in all respects illustrative rather than limiting of the invention described herein. Scope of the invention is thus indicated by the appended claims, rather than by the foregoing description, and all changes that come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. An energy management system, comprising:
 - a) at least one wireless controller in a wireless network for managing at least one energy device based on one or more parts of an energy profile; and
 - b) a management server for receiving energy data from the wireless controller, managing the one or more parts of the energy profile based on the energy data, and transmitting the one or more parts of the energy profile to the wireless controller.
2. The energy management system of claim 1, wherein the energy device comprises at least one of an energy-consuming device or an energy-producing device.
3. The energy management system of claim 1, wherein the wireless network comprises a wireless mesh network.
4. The energy management system of claim 3, wherein the wireless controller further self-configures the wireless mesh network to forward and/or route communication between the wireless controller and the management server.
5. The energy management system of claim 3, further comprising a wireless repeater for extending a range of the wireless mesh network.
6. The energy management system of claim 1, further comprising one or more wireless sensors for collecting the energy data or parts thereof and transmitting the energy data or parts thereof via the wireless network to the wireless controller.
7. The energy management system of claim 1, further comprising a wireless sensor for monitoring the energy device, the wireless sensor being managed by the wireless controller.
8. The energy management system of claim 1, further comprising a wireless gateway for communicating between the wireless network and the management server.
9. The energy management system of claim 8, wherein the sensor monitors the electrical current and power of the energy device.
10. The energy management system of claim 8, wherein the sensor measures a temperature, an environmental level of carbon dioxide, an environmental level of carbon monoxide, a pressure, and/or any combination thereof.
11. The energy management system of claim 1, wherein the managing the energy device comprises controlling, directing, and/or monitoring the energy device.
12. The energy management system of claim 1, wherein the energy data comprises energy consumption data, environmental data, and/or energy generation data.
13. An energy management system, comprising:
 - a) means for managing at least one energy device based on one or more parts of an energy profile;

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means for receiving energy data from the wireless controller;
 means for managing the one or more parts of the energy profile based on the energy data; and
 means for transmitting the one or more parts of the energy profile to the wireless controller.

14. A method for energy management, the method comprising:
 receiving, by a management server, energy data from at least one wireless controller in a wireless network;
 modifying, by the management server, one or more parts of the energy profile based on the energy data;
 transmitting, by the management server, one or more parts of modified energy profile to the wireless controller; and
 managing, by the wireless controller, one or more energy devices based on the one or more parts of the modified energy profile.

15. The method of claim 14, wherein the wireless network comprises a wireless mesh network.

16. The method of claim 15, further comprising self-configuring the wireless mesh network to forward and/or route communication between the wireless controller and the management server.

17. The method of claim 14, further comprising:
 collecting, by one or more wireless sensors, the energy data or parts thereof; and

transmitting, by the one or more wireless sensors, the energy data or parts thereof via the wireless network to the wireless controller.

18. The method of claim 14, further comprising:
 monitoring, by a wireless sensor, the energy device; and
 managing, by the wireless controller, the wireless sensor.

* * * * *



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(12) **United States Patent**
Kates

(10) **Patent No.:** **US 8,020,777 B2**
(45) **Date of Patent:** **Sep. 20, 2011**

(54) **SYSTEM AND METHOD FOR BUDGETED
ZONE HEATING AND COOLING**

(76) **Inventor:** **Lawrence Kates, Covina Del Mar, CA
(US)**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1186 days.

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F24F 3/00 (2006.01)

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700/276**

(58) **Field of Classification Search** **236/1 B;
236/1 C; 49.3; 165/208; 208; 212; 217; 700/276**
See application file for complete search history.

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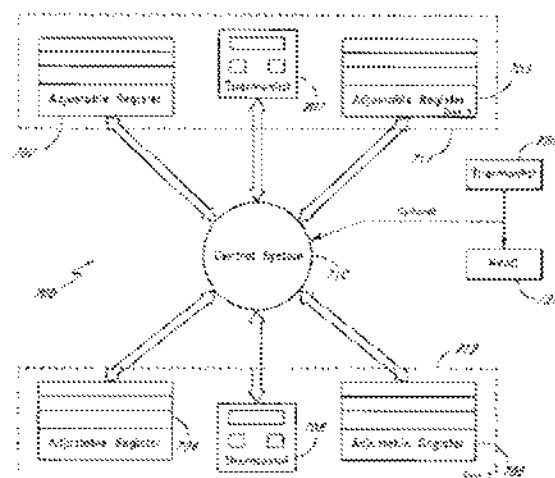
Primary Examiner: **Mark Norman**

(74) **Attorney, Agent, or Firm:** **Pulvinder Patton LLP**

(57) **ABSTRACT**

An Electronically-Controlled Register vent (ECRV) that can be easily installed by a homeowner or general handyman is disclosed. The ECRV can be used to convert a non-zoned HVAC system into a zoned system. The ECRV can also be used in connection with a conventional zoned HVAC system to provide additional control and additional zones not provided by the conventional zoned HVAC system. In one embodiment, the ECRV is configured to have a size and form-factor that conforms to a standard manually-controlled register vent. In one embodiment, a zone thermostat is configured to provide thermostat information to the ECRV. In one embodiment, the zone thermostat communicates with a central monitoring system that coordinates operation of the heating and cooling zones and provides heating and cooling to the various zones according to a cost budget.

61 Claims, 23 Drawing Sheets



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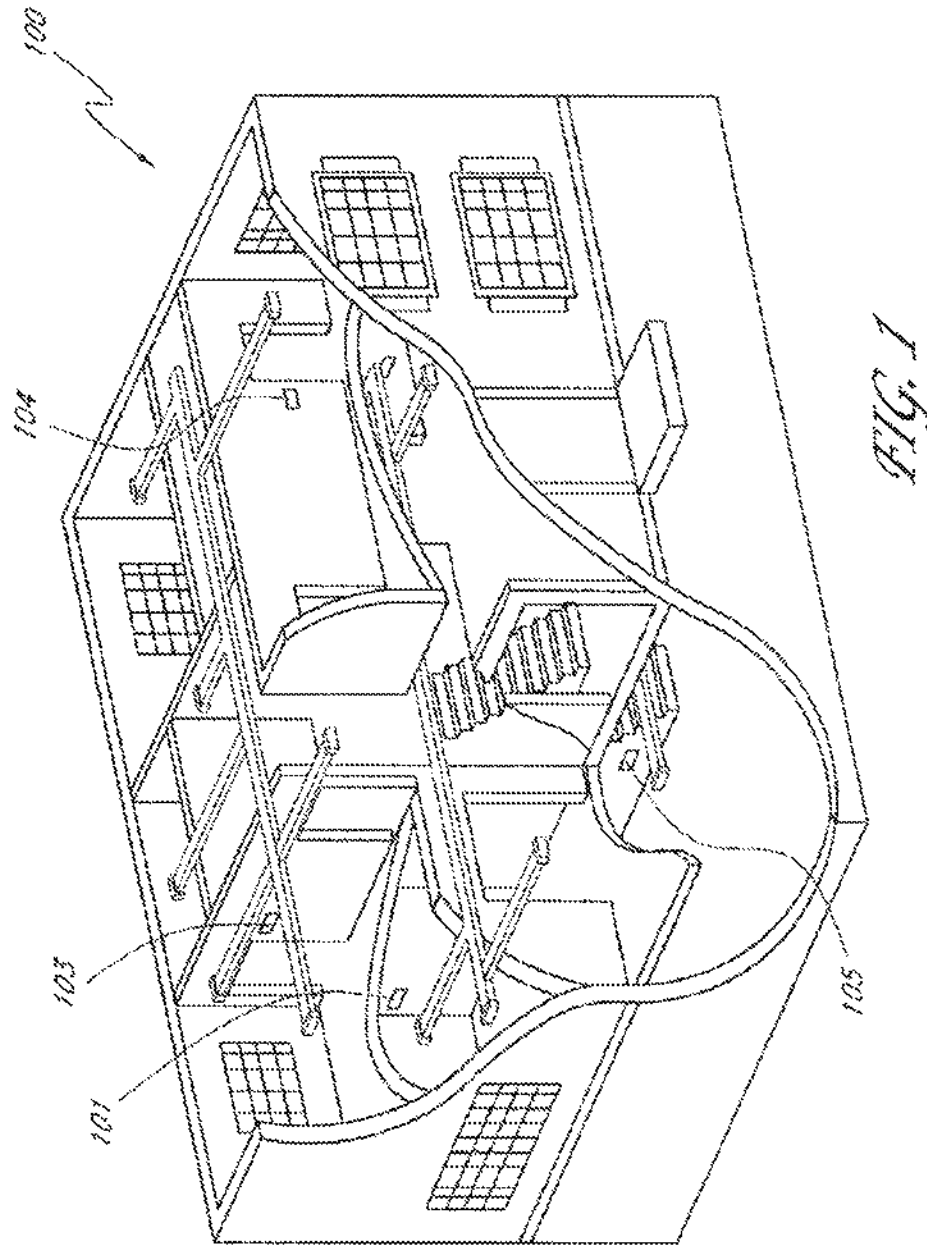
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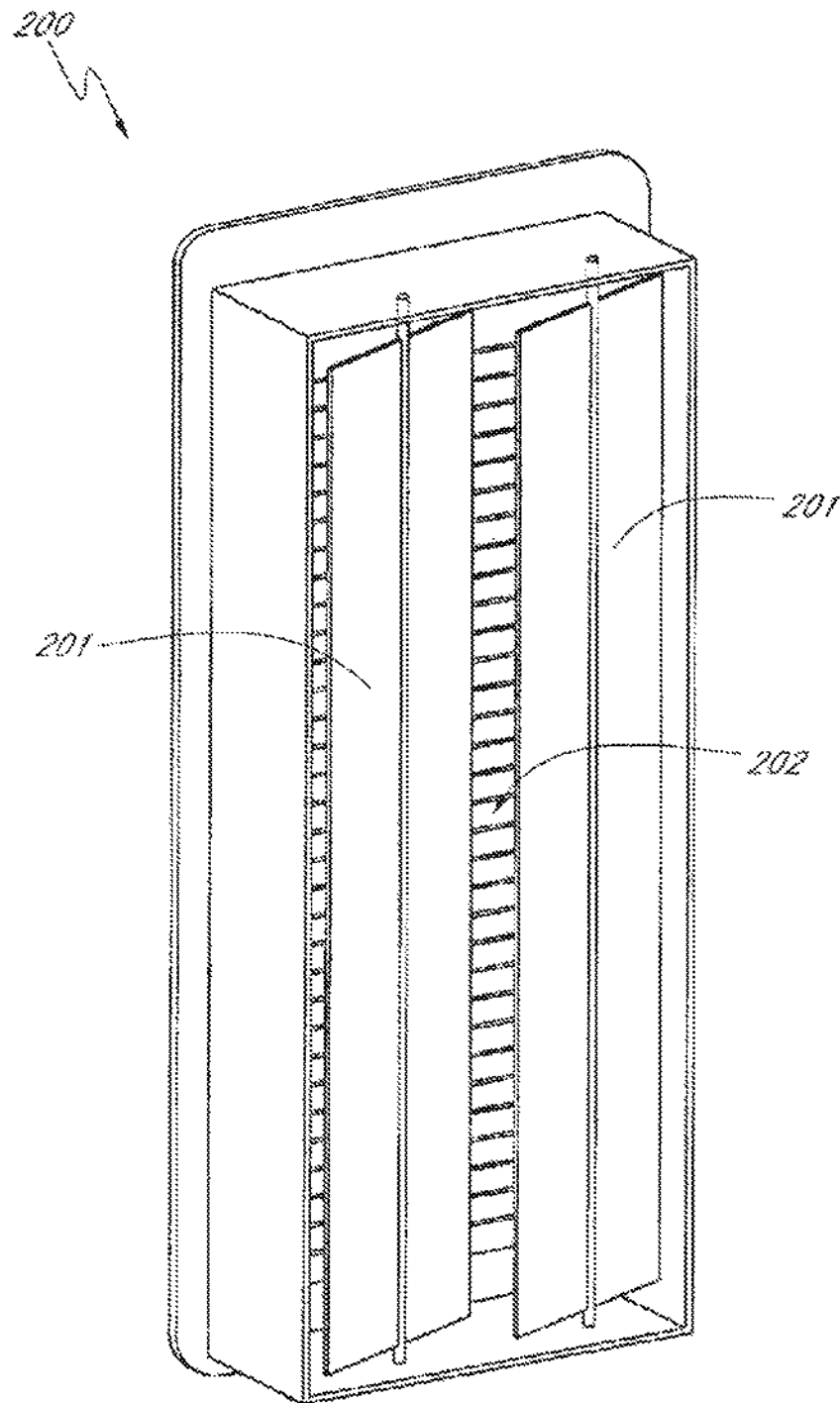


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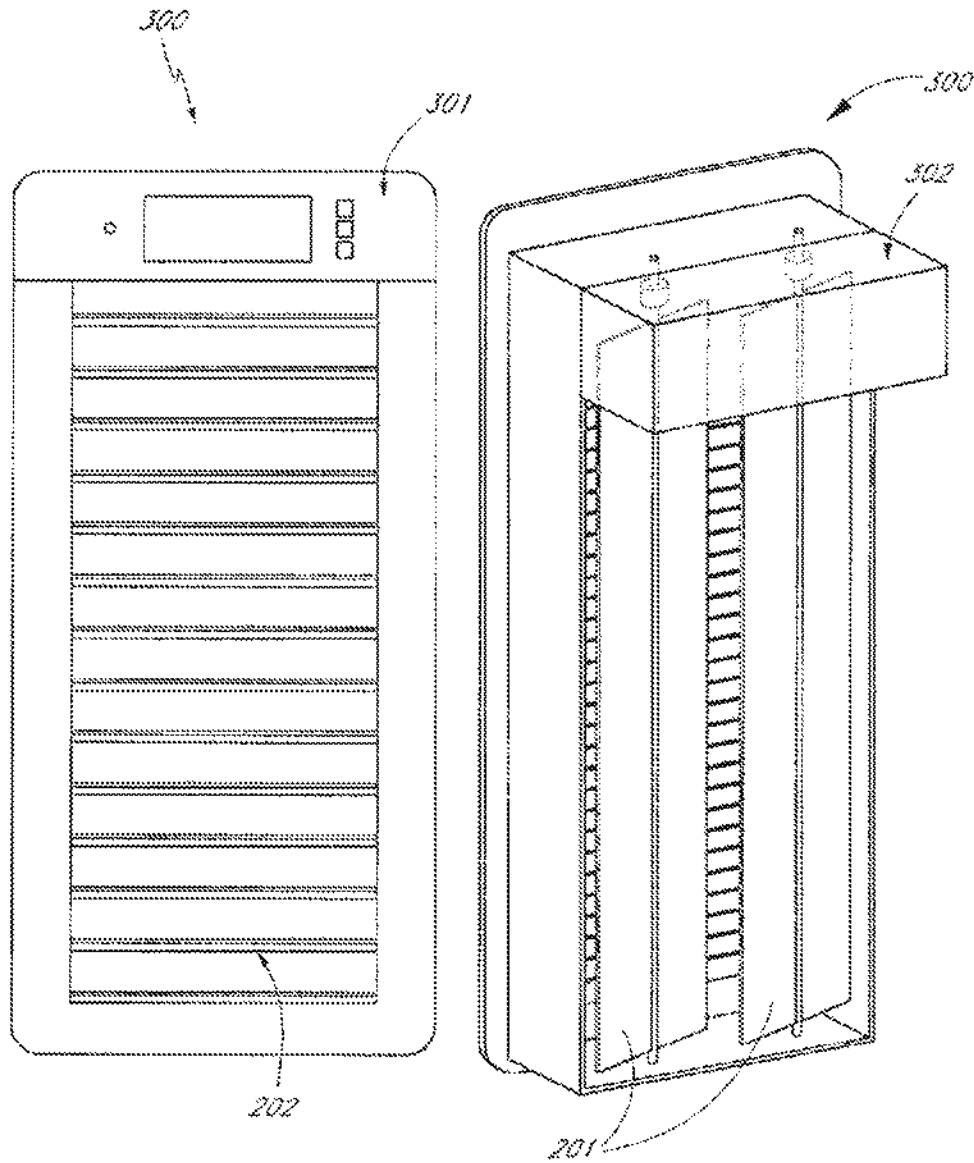


FIG. 3A

FIG. 3B

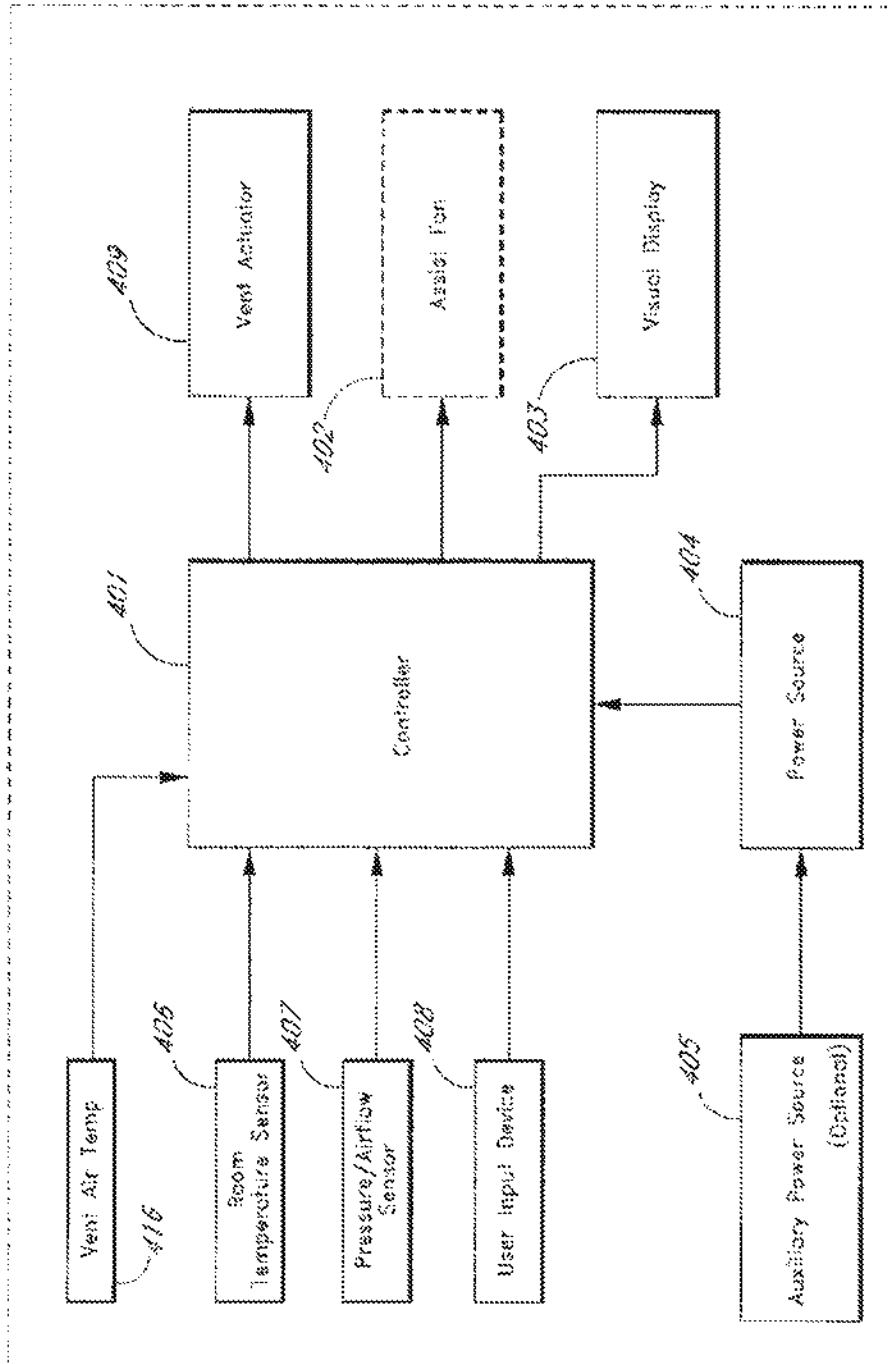


FIG. 4

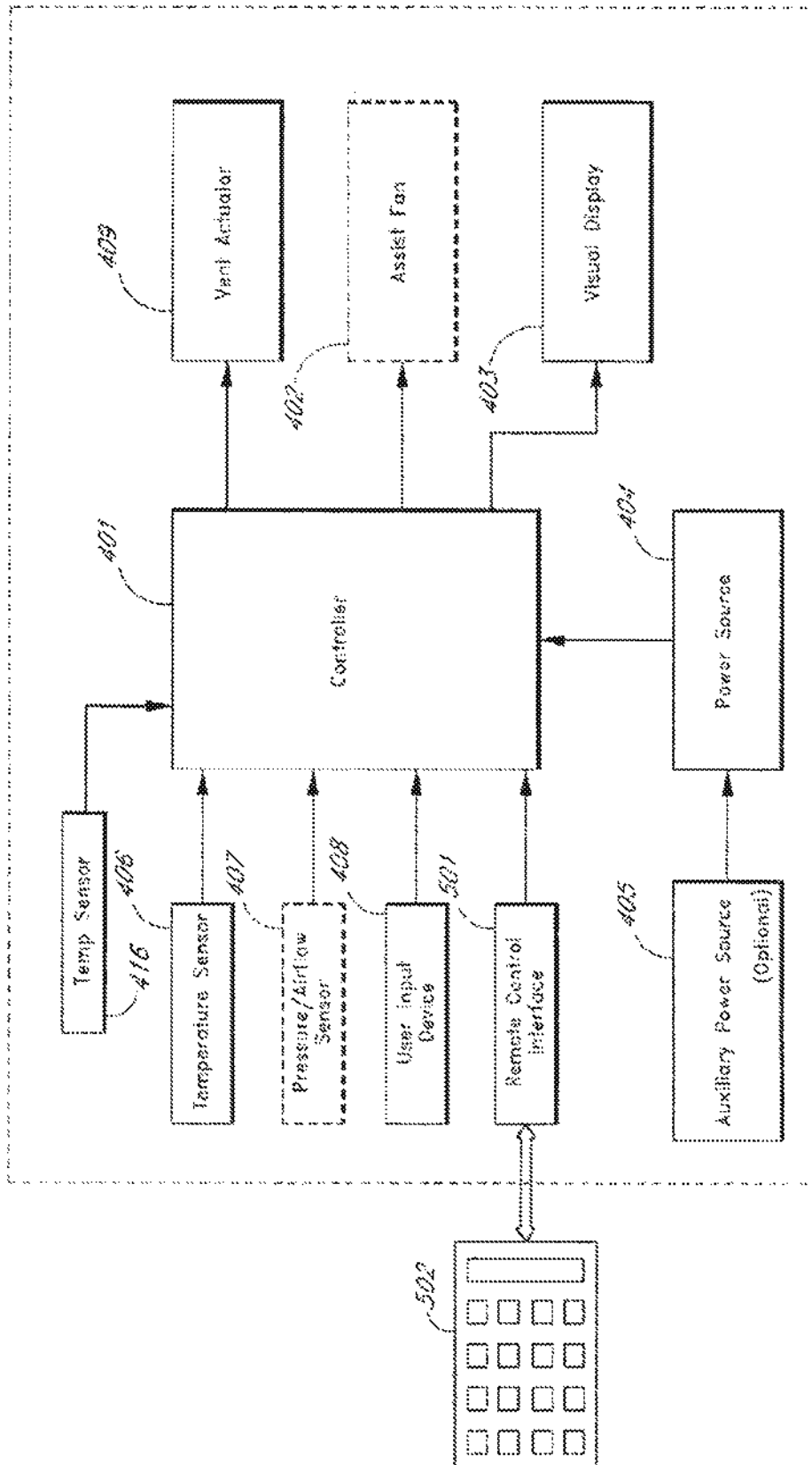


FIG. 5

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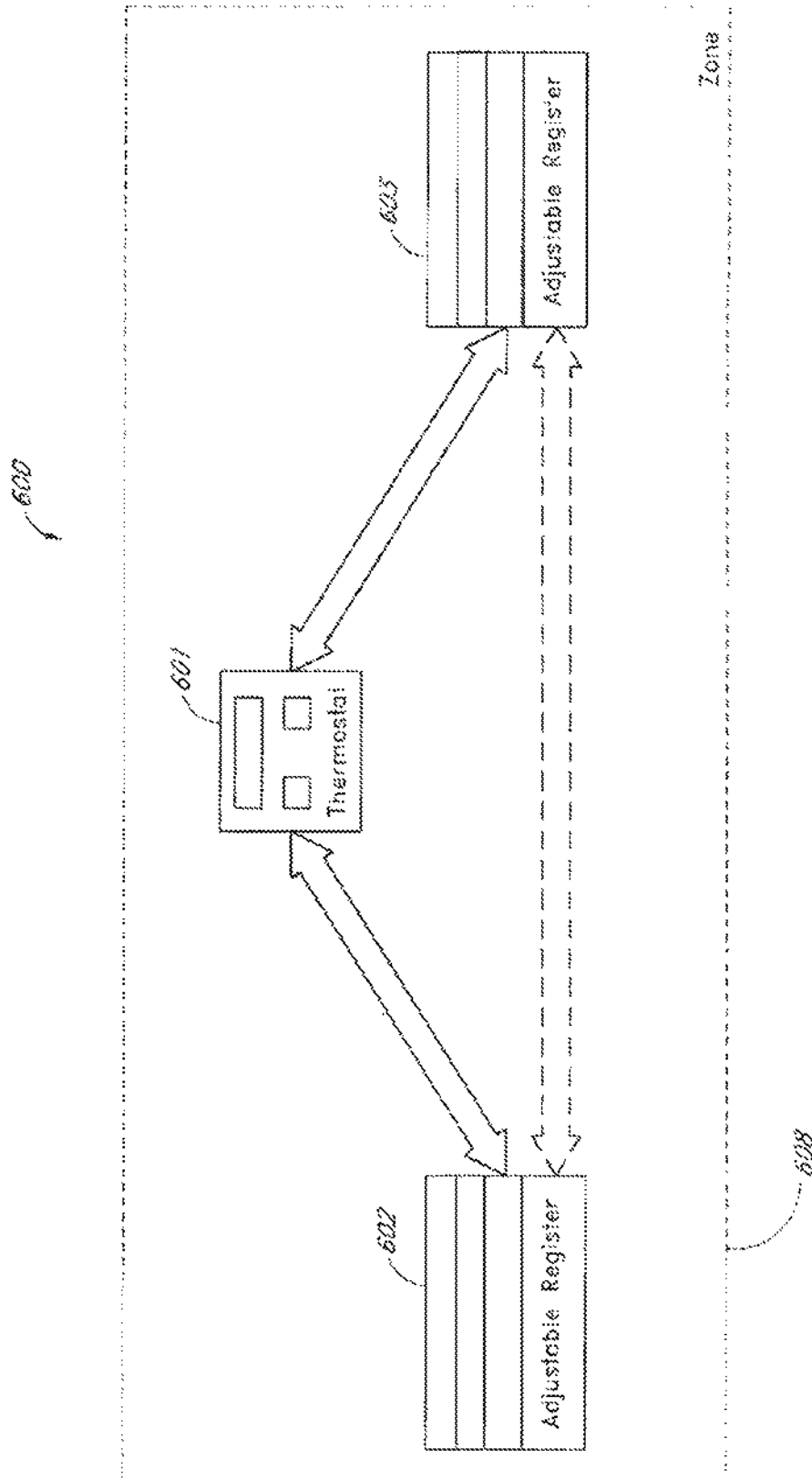


FIG. 6

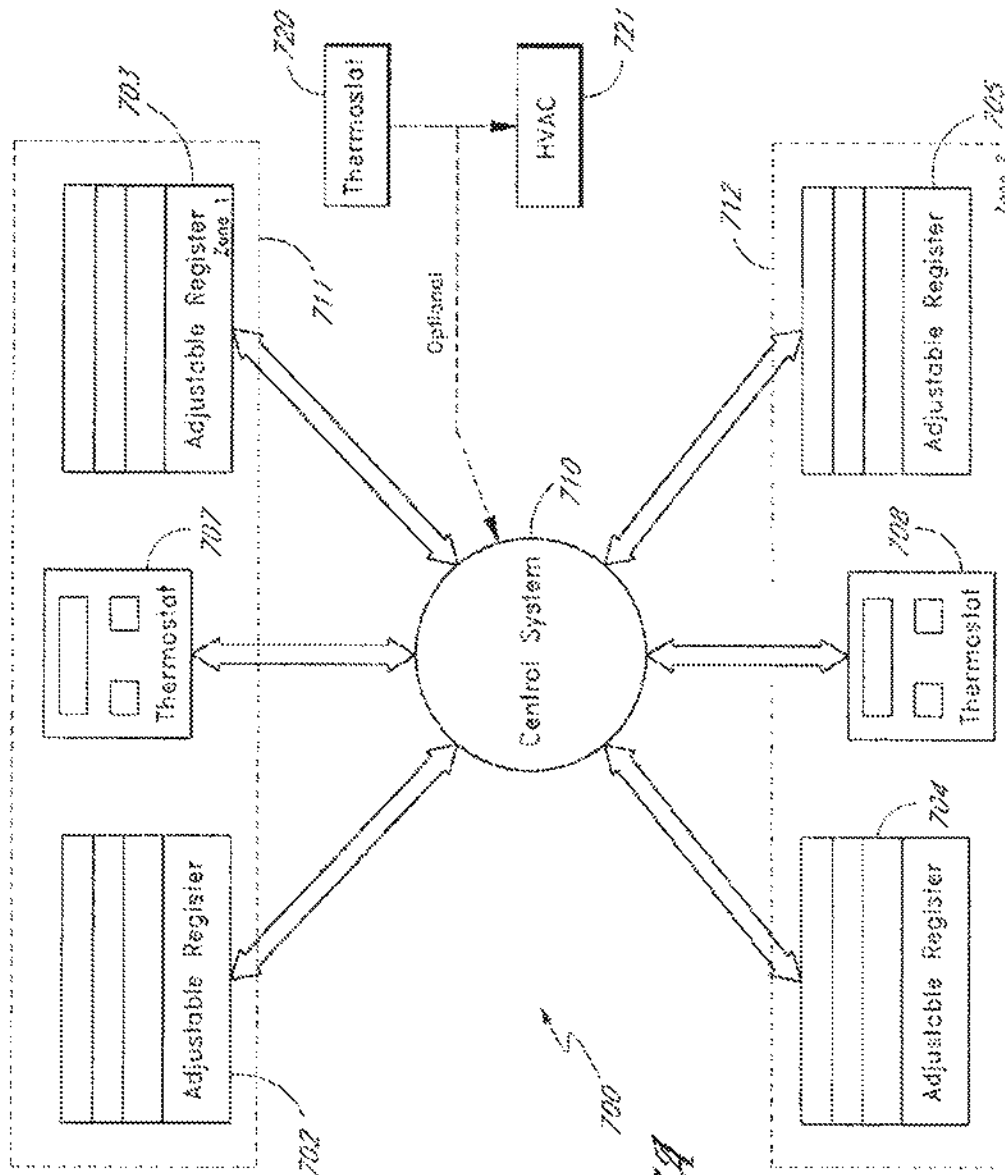


FIG. 7A

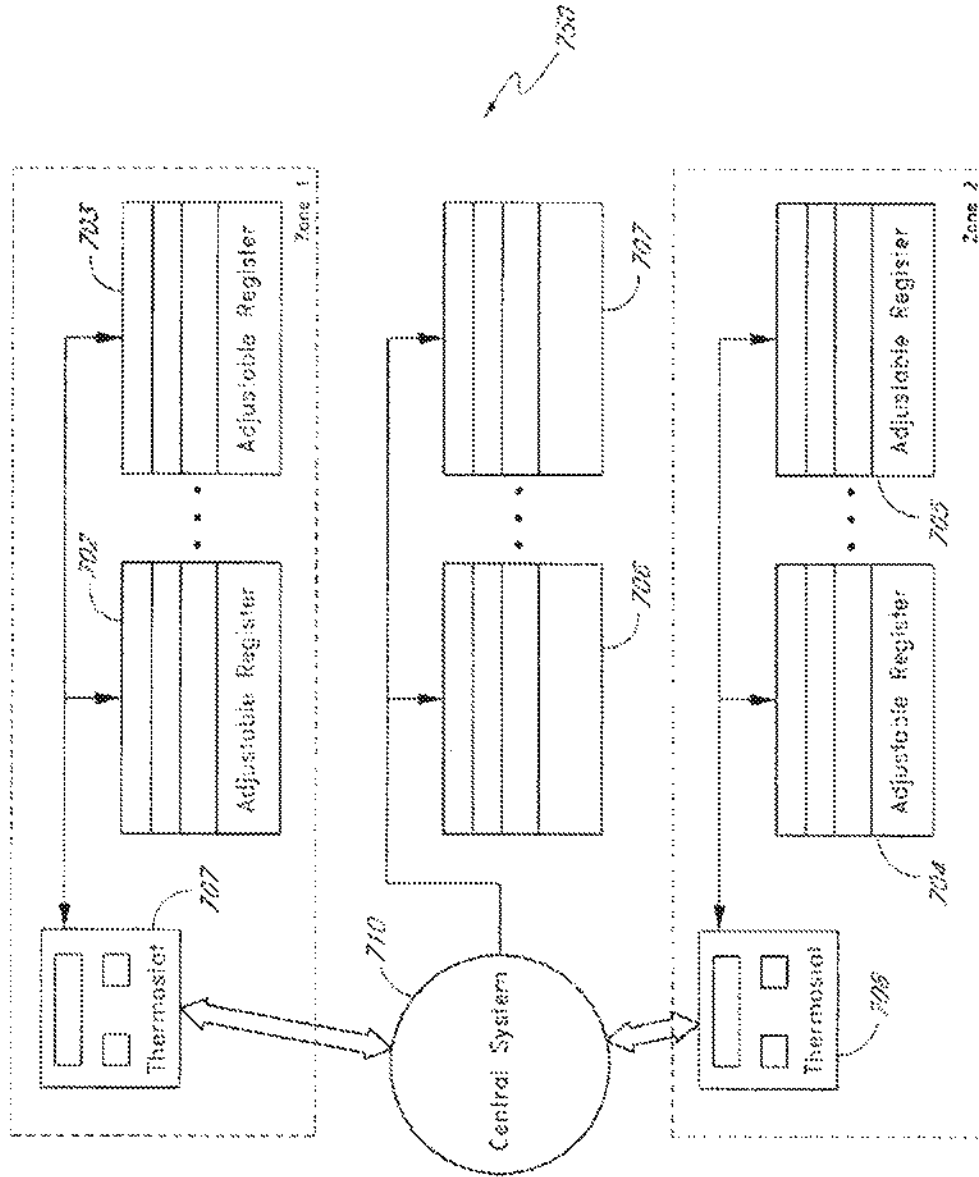


FIG. 7B

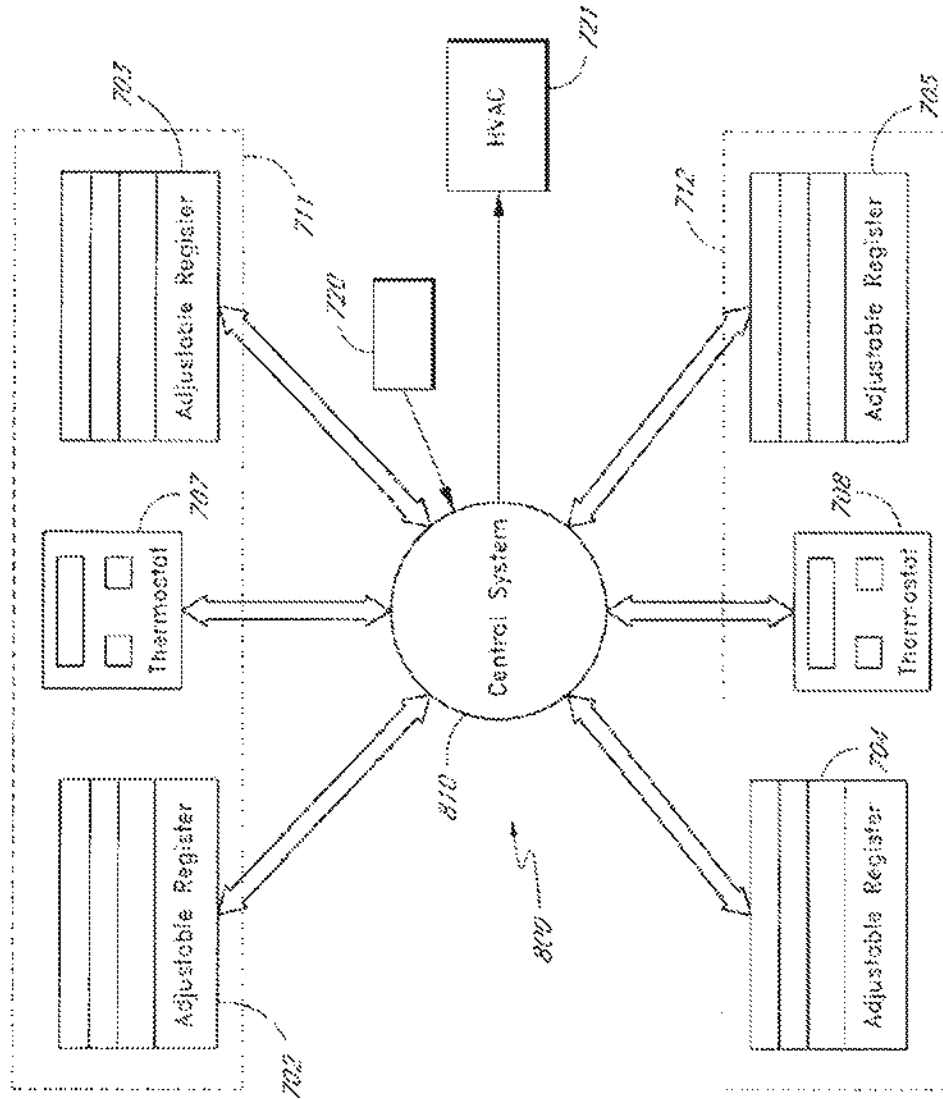


FIG. 8

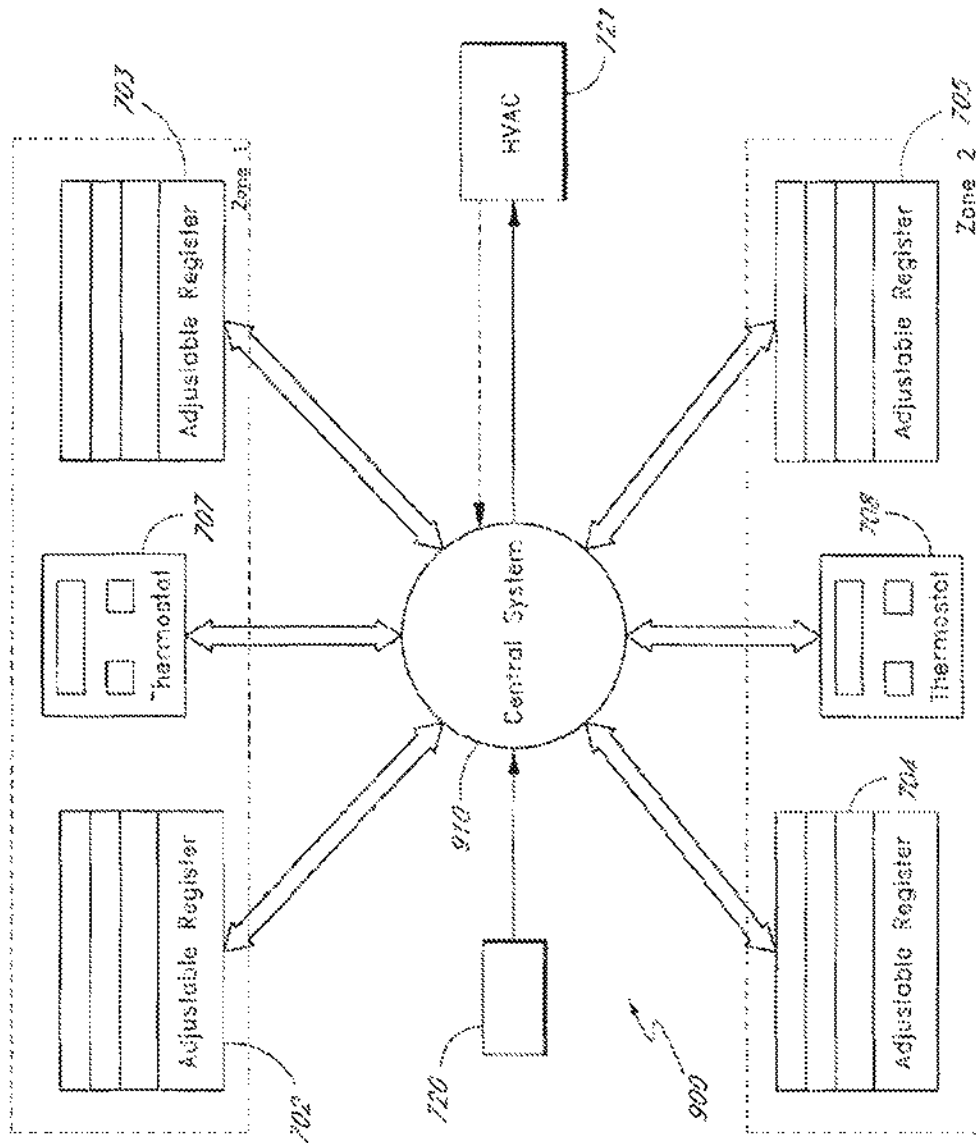
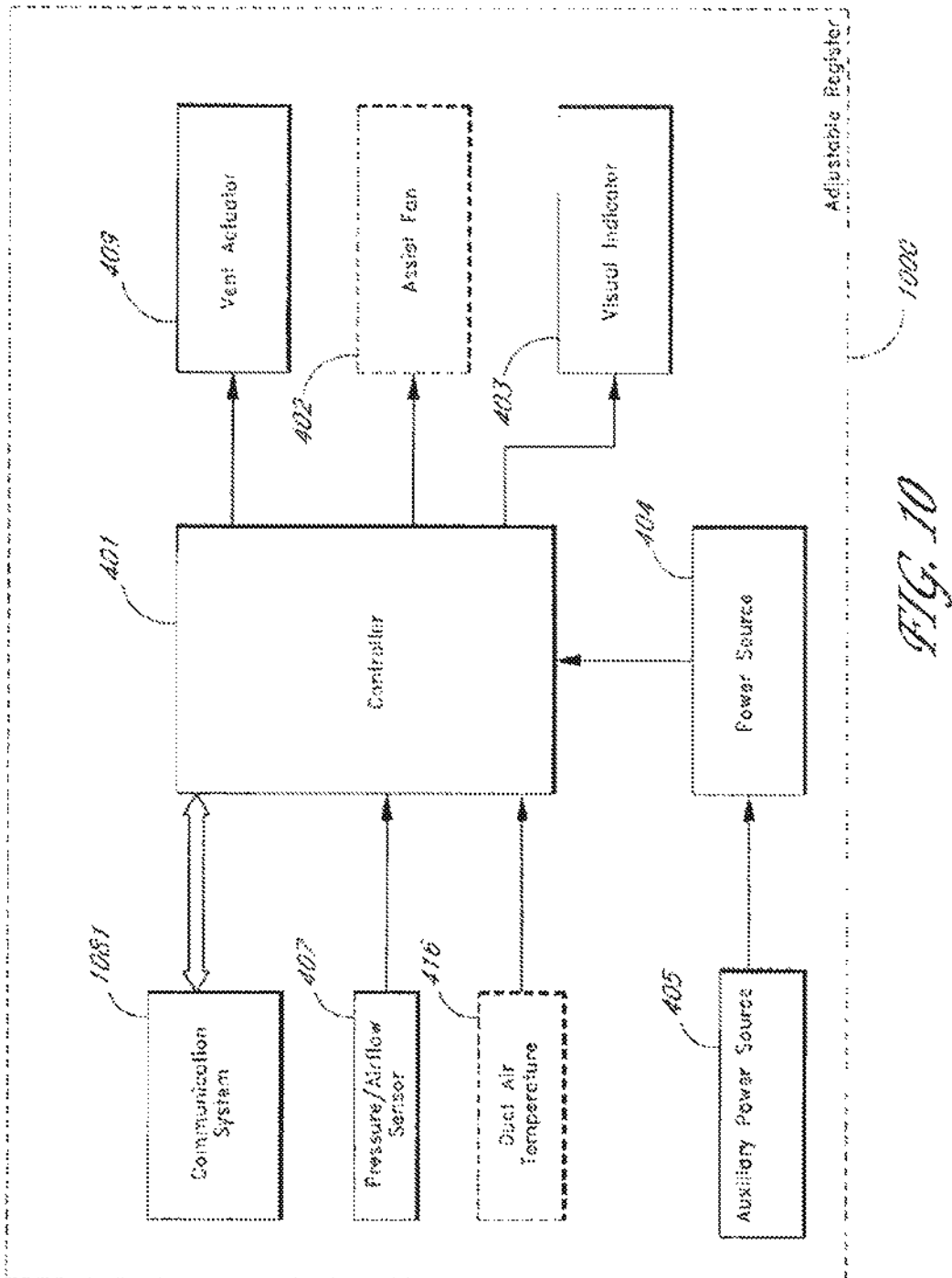
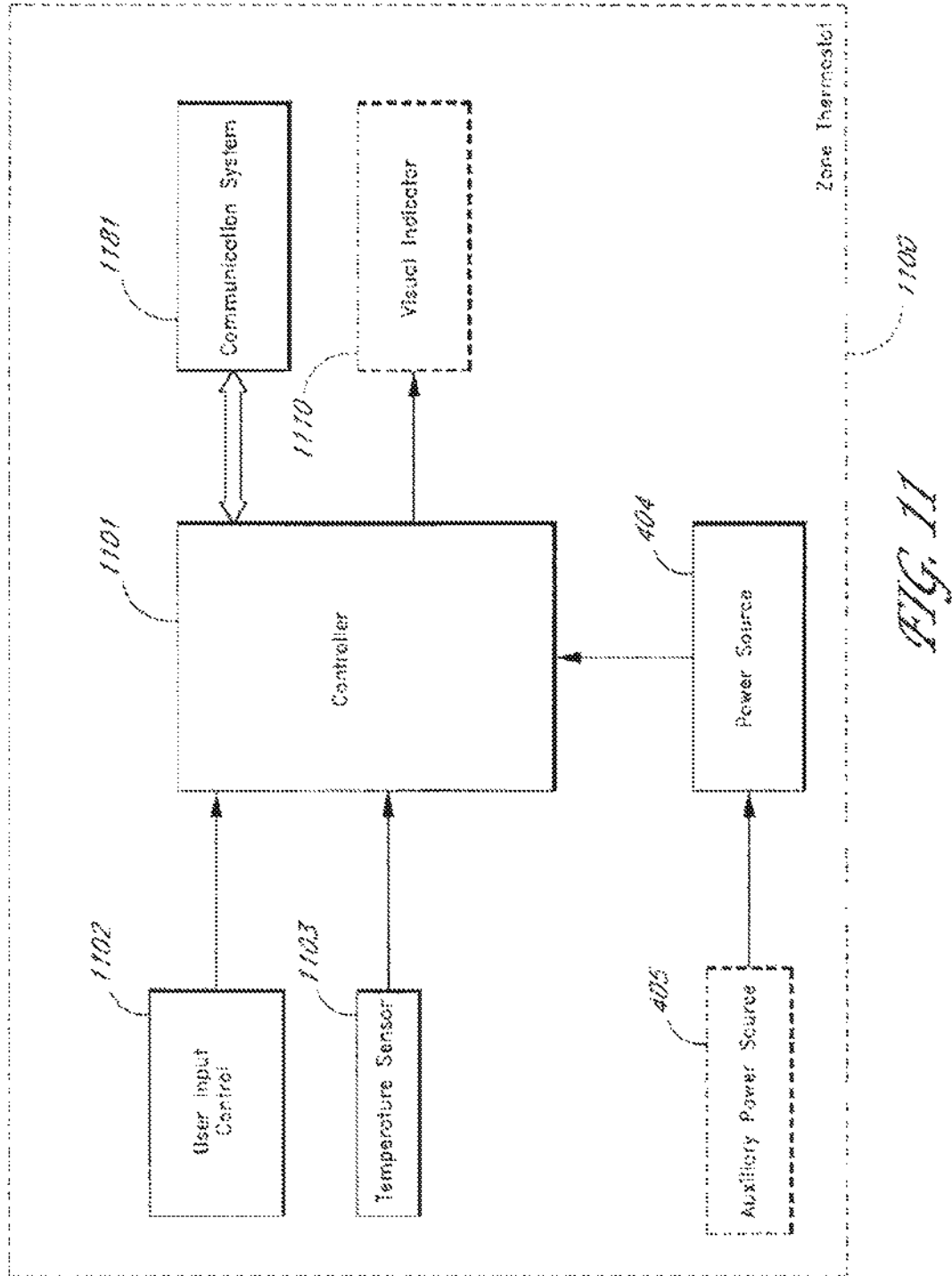
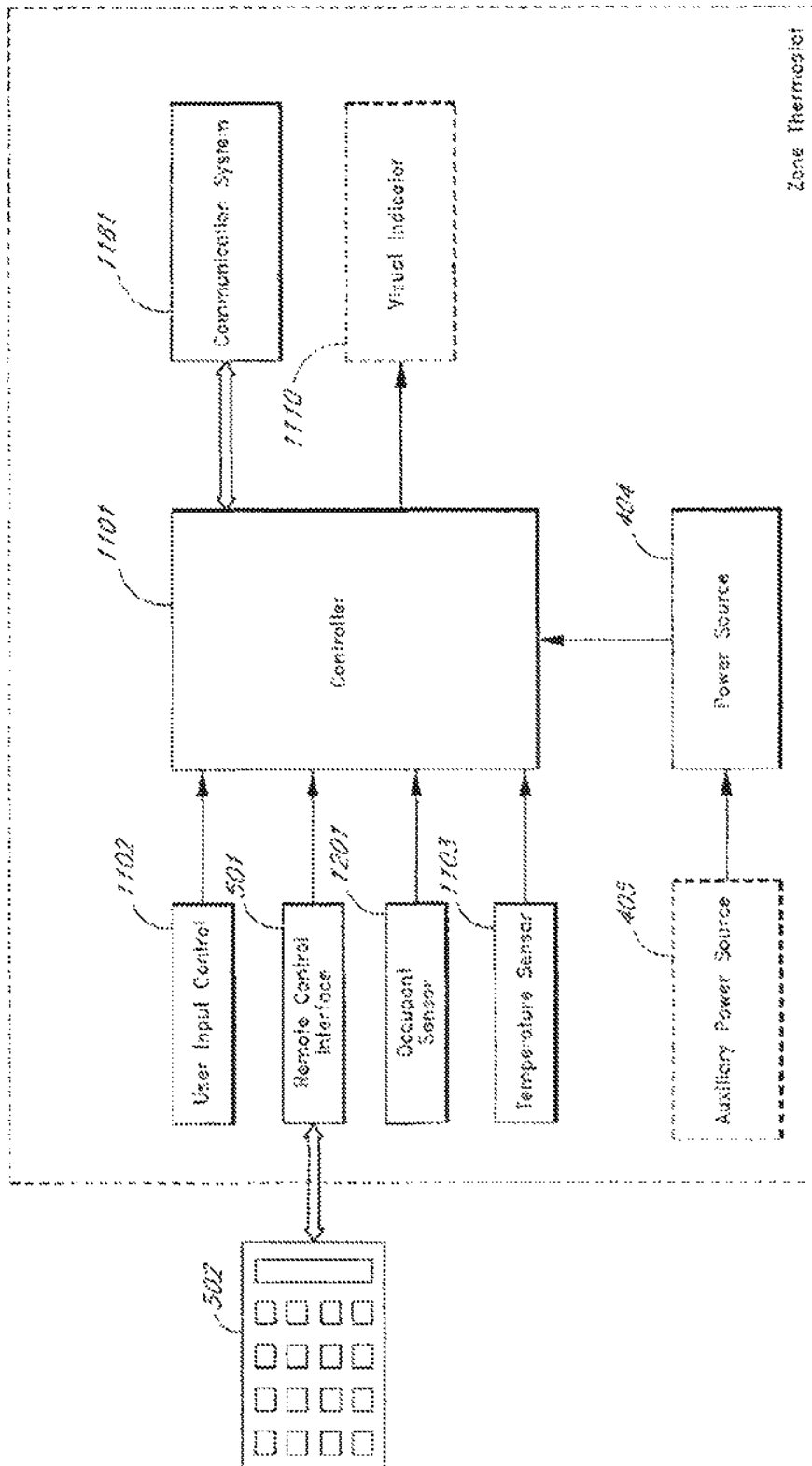


FIG. 9







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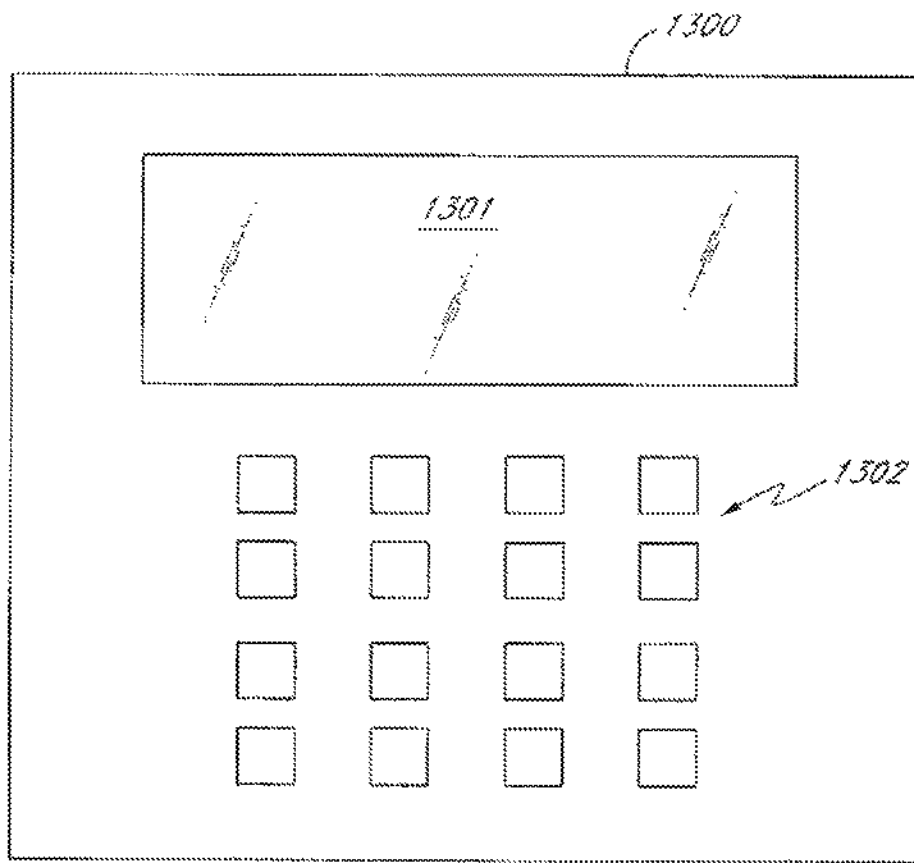
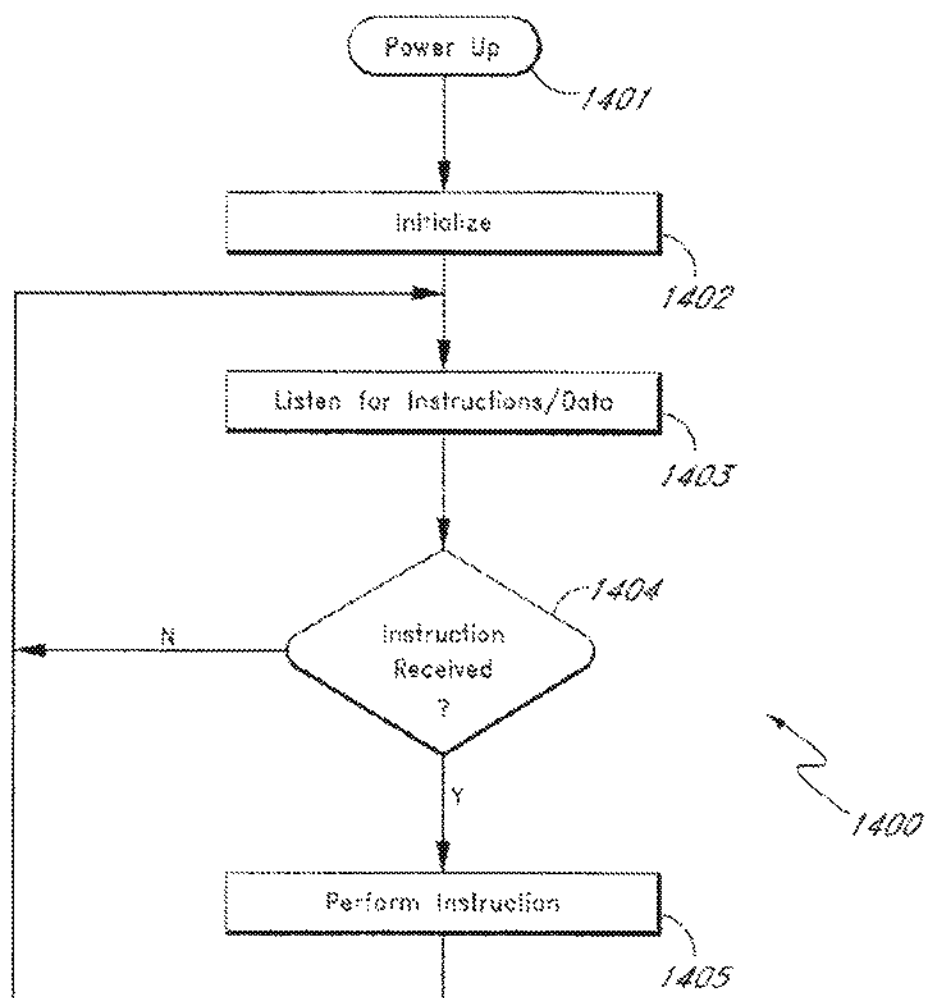


FIG. 13

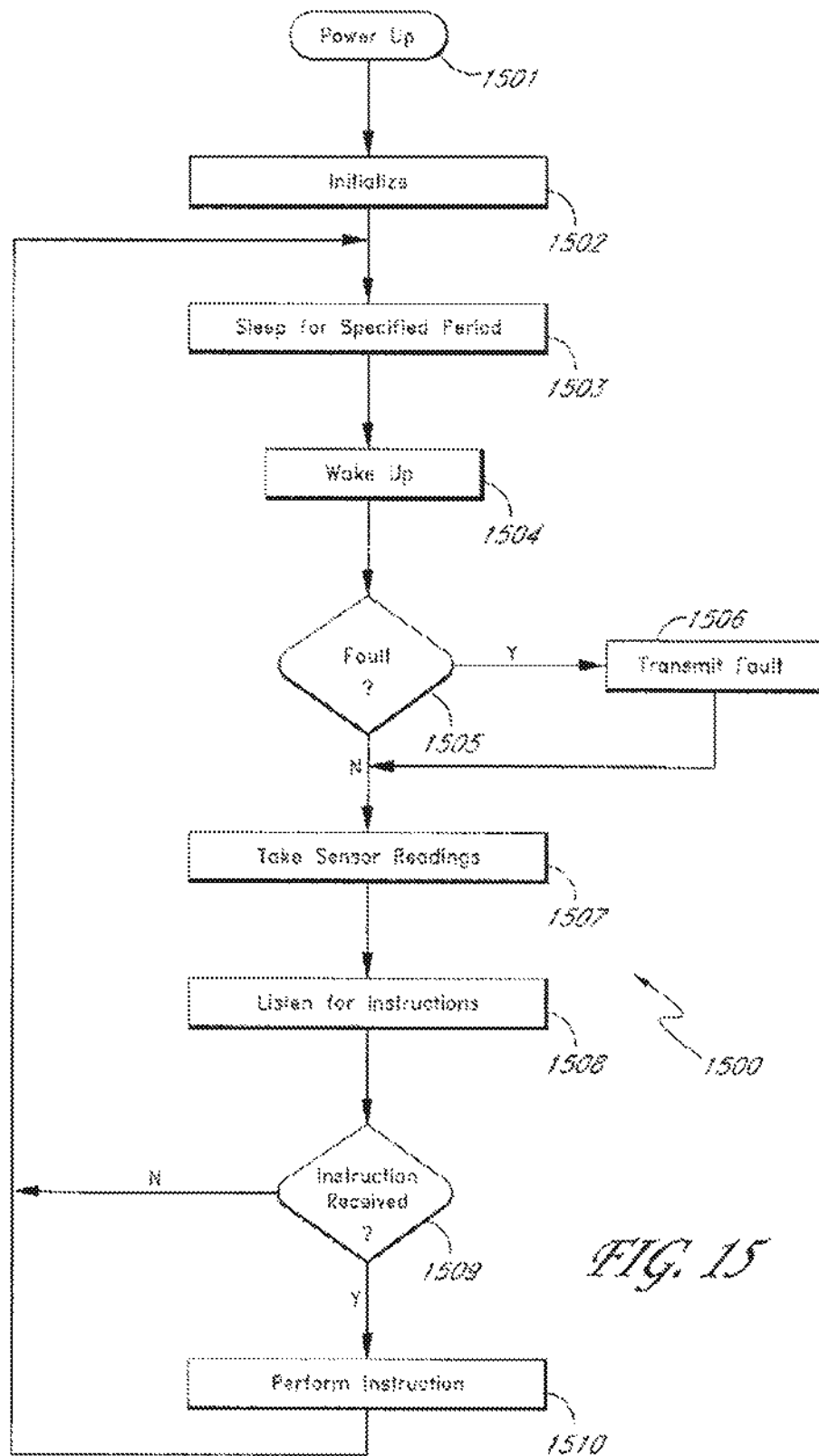
*FIG. 14*

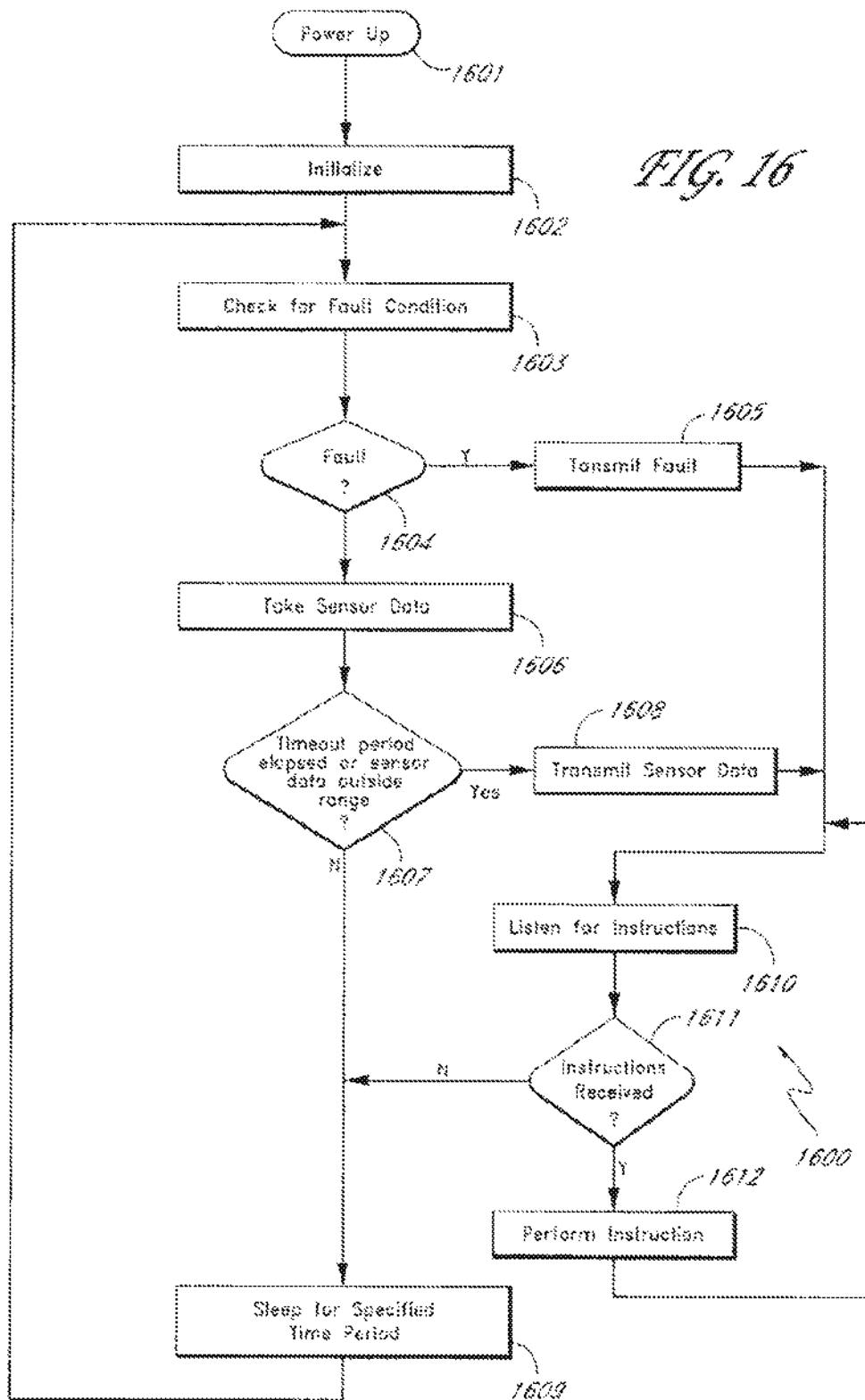
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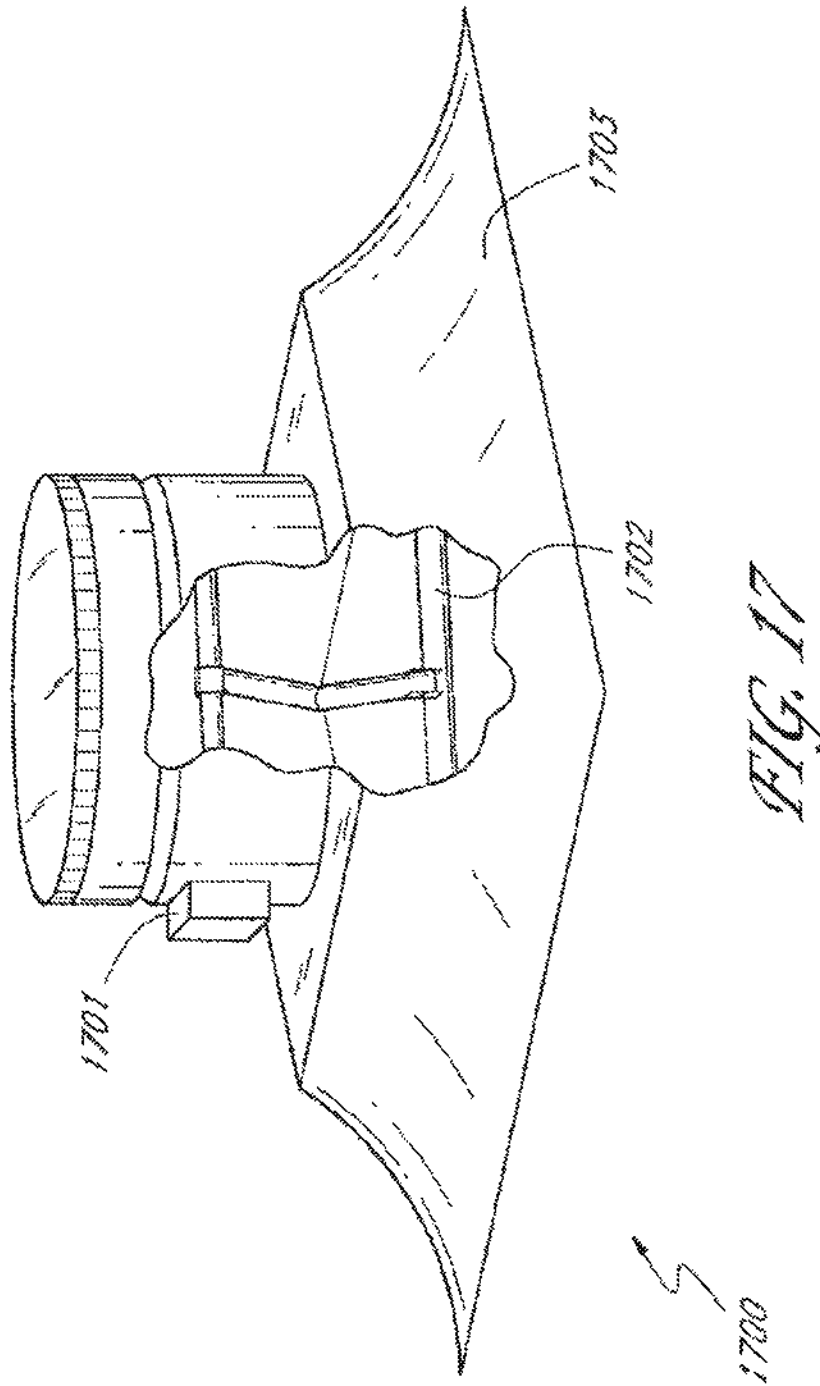
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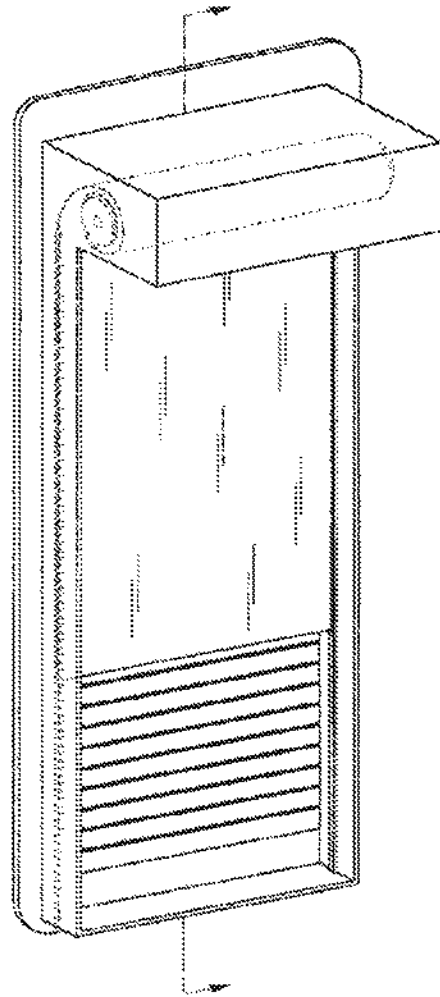
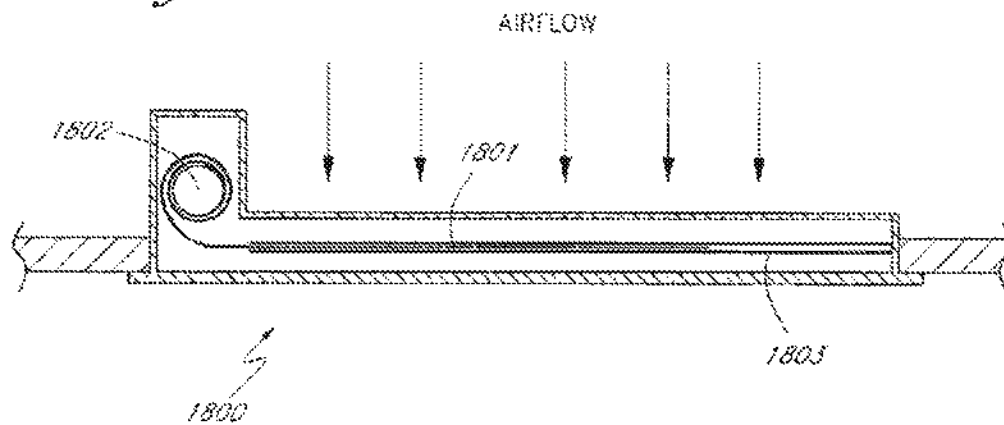


FIG. 18



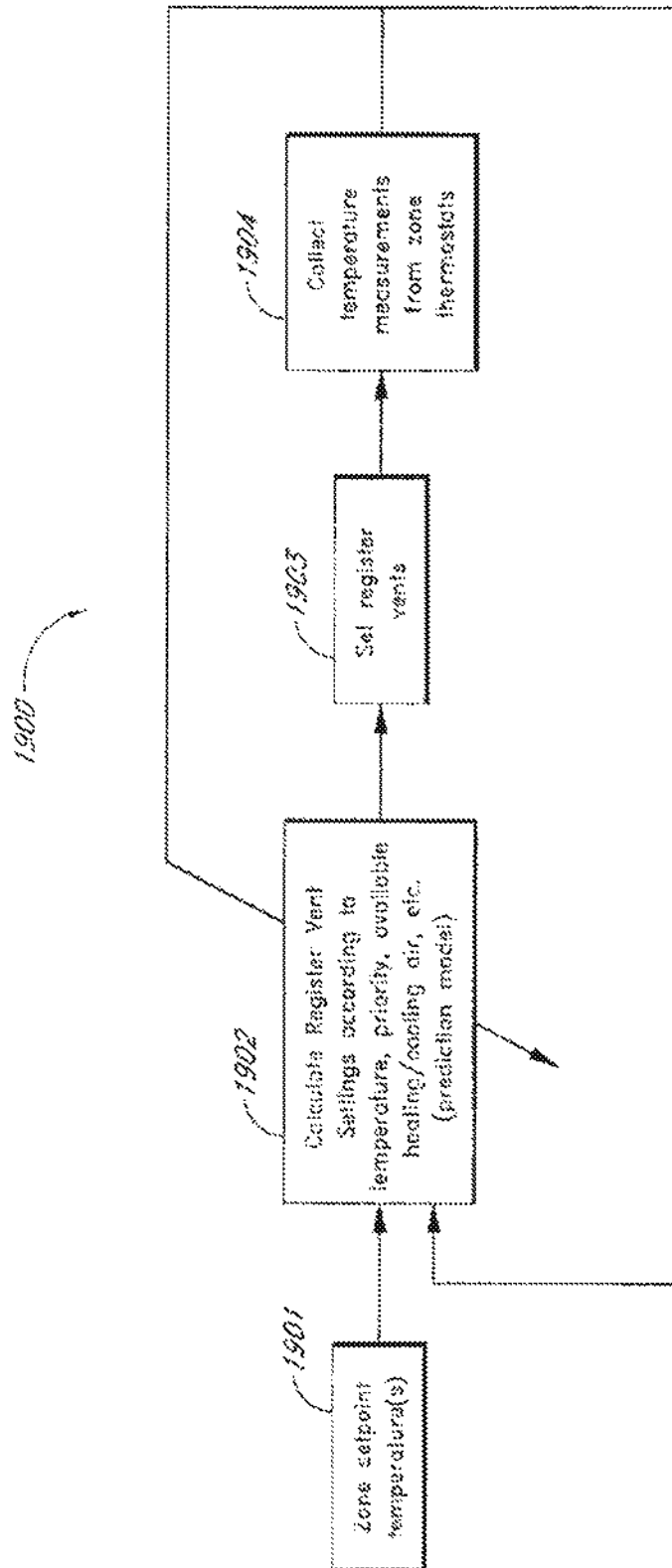
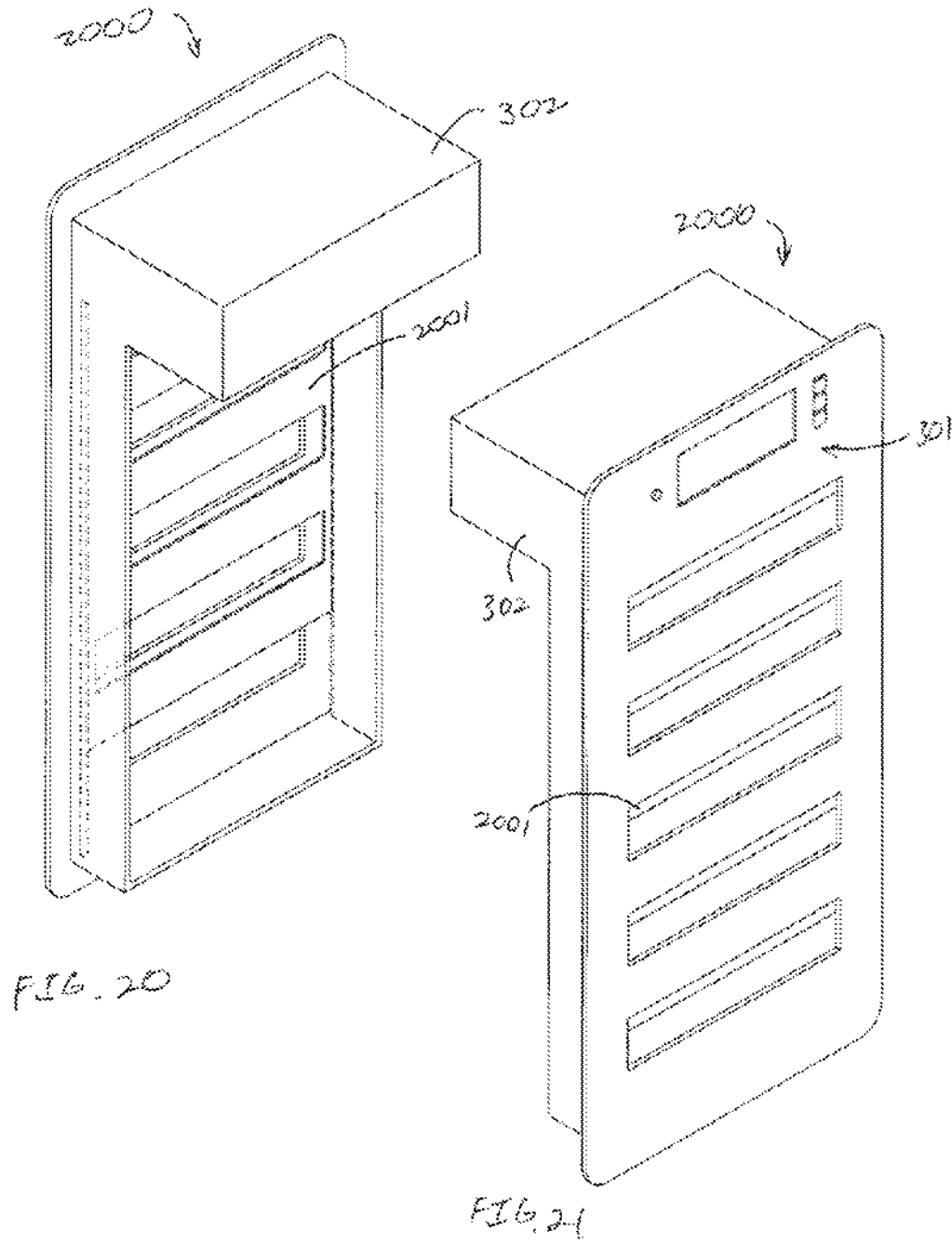


FIG. 19



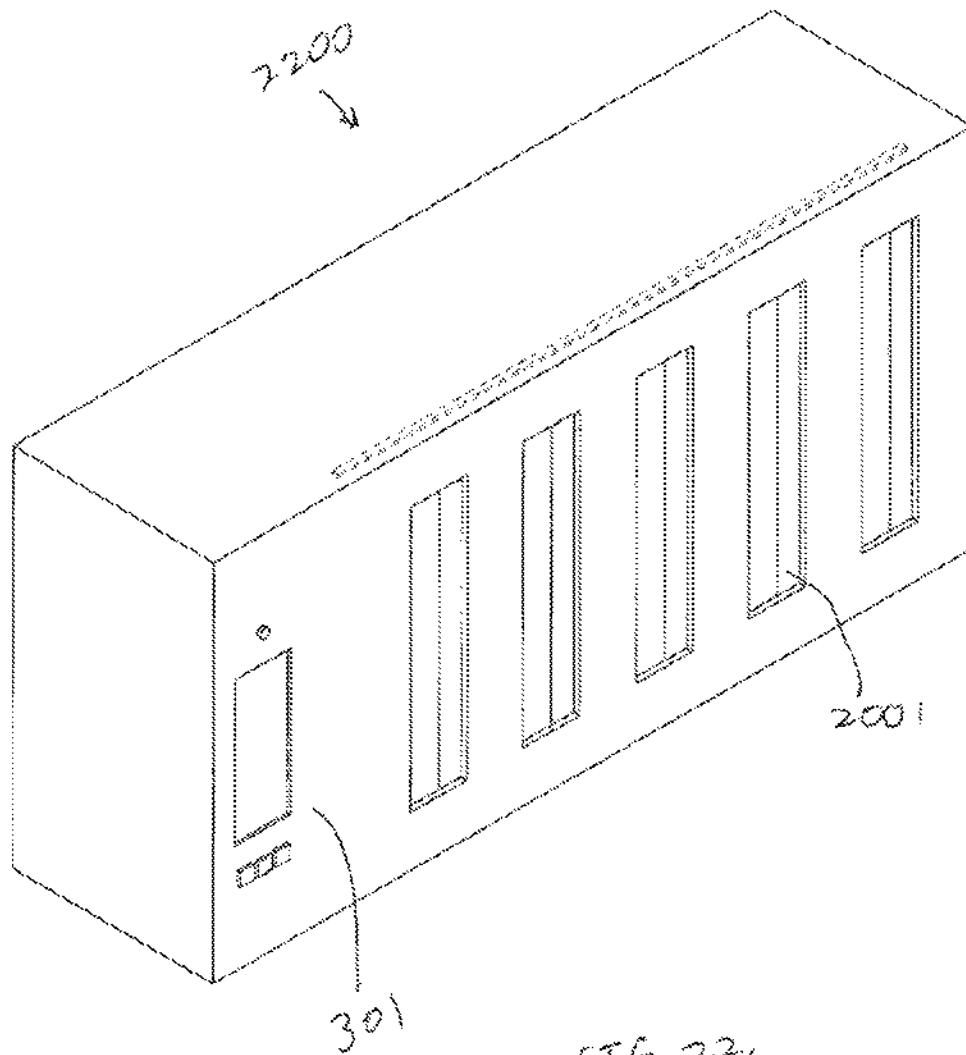


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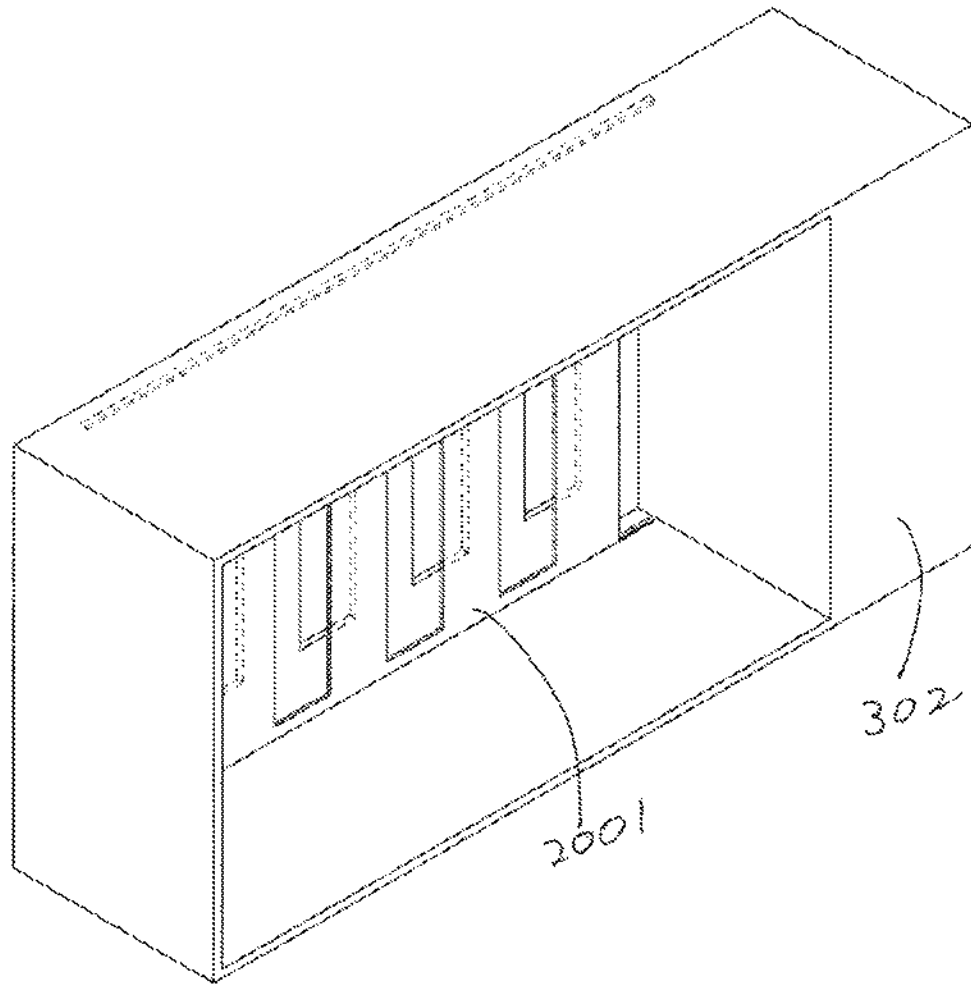


FIG. 23

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SYSTEM AND METHOD FOR BUDGETED ZONE HEATING AND COOLING

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a system and method for directing heating and cooling air from an air handler to various zones in a home or commercial structure.

2. Description of the Related Art

Most traditional home heating and cooling systems have one centrally-located thermostat that controls the temperature of the entire home. The thermostat turns the Heating, Ventilating, and Air-Conditioner (HVAC) system on or off for the entire house. The only way the occupants can control the amount of HVAC air to each room is to manually open and close the register vents throughout the house.

Zoned HVAC systems are common in commercial structures, and zoned systems have been making inroads into the home market. In a zoned system, sensors in each room or group of rooms, or zones, monitor the temperature. The sensors can detect where and when heated or cooled air is needed. The sensors send information to a central controller that activates the zoning system, adjusting motorized dampers in the ductwork and sending conditioned air only to the zone in which it is needed. A zoned system adapts to changing conditions in one area without affecting other areas. For example, many two-story houses are zoned by floor. Because heat rises, the second floor usually requires more cooling in the summer and less heating in the winter than the first floor. A non-zoned system cannot completely accommodate this seasonal variation. Zoning, however, can reduce the wide variations in temperature between floors by supplying heating or cooling only to the space that needs it.

A zoned system allows more control over the indoor environment because the occupants can decide which areas to heat or cool and when. With a zoned system, the occupants can program each specific zone to be active or inactive depending on their needs. For example, the occupants can set the bedrooms to be inactive during the day while the kitchen and living areas are active.

A properly zoned system can be up to 30 percent more efficient than a non-zoned system. A zoned system supplies warm or cool air only to those areas that require it. Thus, less energy is wasted heating and cooling spaces that are not being used.

In addition, a zoned system can sometimes allow the installation of smaller capacity equipment without compromising comfort. This reduces energy consumption by reducing wasted capacity.

Unfortunately, the equipment currently used in a zoned system is relatively expensive. Moreover, installing a zoned HVAC system, or retrofitting an existing system, is far beyond the capabilities of most homeowners. Unless the homeowner has specialized training, it is necessary to hire a specially-trained professional HVAC technician to configure and install the system. This makes zoned HVAC systems expensive to purchase and install. The cost of installation is such that even though the zoned system is more efficient, the payback period on such systems is many years. Such expense has severely limited the growth of zoned HVAC systems in the general home market.

SUMMARY

The system and method disclosed herein solves these and other problems by providing an Electronically-Controlled

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Register Vent (ECRV) that can be easily installed by a homeowner or general handyman. The ECRV can be used to convert a non-zoned HVAC system into a zoned system. The ECRV can also be used in combination with a conventional zoned HVAC system to provide additional control and additional zones not provided by the conventional zoned HVAC system. In one embodiment, the ECRV is configured have a size and form-factor that conforms to a standard manually-controlled register vent. The ECRV can be installed in place of a conventional manually-controlled register vent—often without the use of tools.

In one embodiment, the ECRV is a self-contained zoned system unit that includes a register vent, a power supply, a thermostat, and a motor to open and close the register vent. To create a zoned HVAC system, the homeowner can simply remove the existing register vents in one or more rooms and replace the register vents with the ECRVs. The occupants can set the thermostat on the ECRV to control the temperature of the area or room containing the ECRV. In one embodiment, the ECRV includes a display that shows the programmed setpoint temperature. In one embodiment, the ECRV includes a display that shows the current setpoint temperature. In one embodiment, the ECRV includes a remote control interface to allow the occupants to control the ECRV by using a remote control. In one embodiment, the remote control includes a display that shows the programmed temperature and the current temperature. In one embodiment, the remote control shows the battery status of the ECRV.

In one embodiment, the ECRV includes a pressure sensor to measure the pressure of the air in the ventilation duct that supplies air to the ECRV. In one embodiment, the ECRV opens the register vent if the air pressure in the duct exceeds a specified value. In one embodiment, the pressure sensor is configured as a differential pressure sensor that measures the difference between the pressure in the duct and the pressure in the room.

In one embodiment, the ECRV is powered by an internal battery. A battery-low indicator on the ECRV informs the homeowner when the battery needs replacement. In one embodiment, one or more solar cells are provided to recharge the batteries when light is available. In one embodiment, the register vent includes a fan to draw additional air from the supply duct in order to compensate for undersized vents or zones that need additional heating or cooling air.

In one embodiment, one or more ECRVs in a zone communicate with a zone thermostat. The zone thermostat measures the temperature of the zone for all of the ECRVs that control the zone. In one embodiment, the ECRVs and the zone thermostat communicate by wireless communication methods, such as, for example, infrared communication, radio-frequency communication, ultrasonic communication, etc. In one embodiment, the ECRVs and the zone thermostat communicate by direct wire connections. In one embodiment, the ECRVs and the zone thermostat communicate using power-line communication.

In one embodiment, one or more zone thermostats communicate with a central controller.

In one embodiment, the ECRV and/or the zoned thermostat includes an occupant sensor, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc. The occupants can program the ECRV or the zoned thermostat to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one embodiment, the occupants can program the ECRV or the zoned thermostat to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g., bedroom, kitchen, etc.), and/or whether the room is occupied or empty. In one

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embodiment, various ECRVs and/or zoned thermostats thought a composite zone (e.g., a group of zones such as an entire house, an entire floor, an entire wing, etc.) intercommunicate and change the temperature setpoints according to whether the composite zone is empty or occupied.

In one embodiment, the home occupants can provide a priority schedule for the zones based on whether the zones are occupied, the time of day, the time of year, etc. Thus, for example, if zone corresponds to a bedroom and zone corresponds to a living room, zone can be given a relatively lower priority during the day and a relatively higher priority during the night. As a second example, if zone corresponds to a first floor, and zone corresponds to a second floor, then zone can be given a higher priority in summer (since upper floors tend to be harder to cool) and a lower priority in winter (since lower floors tend to be harder to heat). In one embodiment, the occupants can specify a weighted priority between the various zones.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a home with zoned heating and cooling.

FIG. 2 shows one example of a conventional manually-controlled register vent.

FIG. 3A is a front view of one embodiment of an electronically-controlled register vent.

FIG. 3B is a rear view of the electronically-controlled register vent shown in FIG. 3A.

FIG. 4 is a block diagram of a self-contained ECRV.

FIG. 5 is a block diagram of a self-contained ECRV with a remote control.

FIG. 6 is a block diagram of a locally-controlled zoned heating and cooling system wherein a zone thermostat controls one or more ECRVs.

FIG. 7A is a block diagram of a centrally-controlled zoned heating and cooling system wherein the central control system communicates with one or more zone thermostats and one or more ECRVs independently of the HVAC system.

FIG. 7B is a block diagram of a centrally-controlled zoned heating and cooling system wherein the central control system communicates with one or more zone thermostats and the zone thermostats communicate with one or more ECRVs.

FIG. 8 is a block diagram of a centrally-controlled zoned heating and cooling system wherein a central control system communicates with one or more zone thermostats and one or more ECRVs and controls the HVAC system.

FIG. 9 is a block diagram of an efficiency-monitoring centrally-controlled zoned heating and cooling system wherein a central control system communicates with one or more zone thermostats and one or more ECRVs and controls and monitors the HVAC system.

FIG. 10 is a block diagram of an ECRV for use in connection with the systems shown in FIGS. 6-9.

FIG. 11 is a block diagram of a basic zone thermostat for use in connection with the systems shown in FIGS. 6-9.

FIG. 12 is a block diagram of a zone thermostat with remote control for use in connection with the systems shown in FIGS. 6-9.

FIG. 13 shows one embodiment of a central monitoring system.

FIG. 14 is a flowchart showing one embodiment of an instruction loop for an ECRV or zone thermostat.

FIG. 15 is a flowchart showing one embodiment of an instruction and sensor data loop for an ECRV or zone thermostat.

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FIG. 16 is a flowchart showing one embodiment of an instruction and sensor data reporting loop for an ECRV or zone thermostat.

FIG. 17 shows an ECRV configured to be used in connection with a conventional T-bar ceiling system found in many commercial structures.

FIG. 18 shows an ECRV configured to use a scrolling curtain to control airflow as an alternative to the vanes shown in FIGS. 2 and 3.

FIG. 19 is a block diagram of a control algorithm for controlling the register vents.

FIG. 20 is a front view of one embodiment of an electronically-controlled register vent with a slanted sliding member to provide opening and closing of the vent.

FIG. 21 is a rear view of the electronically-controlled register vent shown in FIG. 20.

FIG. 22 is a front view of one embodiment of an electronically-controlled register vent configured to fit over a vent opening.

FIG. 23 is a rear view of the electronically-controlled register vent shown in FIG. 22.

DETAILED DESCRIPTION

FIG. 1 shows a home 100 with zoned heating and cooling. In the home 100, an HVAC system provides heating and cooling air to a system of ducts. Sensors 101-105 monitor the temperature in various areas (zones) of the house. A zone can be a room, a floor, a group of rooms, etc. The sensors 101-105 detect where and when heating or cooling air is needed. Information from the sensors 101-105 is used to control actuators that adjust the flow of air to the various zones. The zoned system adapts to changing conditions in one area without affecting other areas. For example, many two-story houses are zoned by floor. Because heat rises, the second floor usually requires more cooling in the summer and less heating in the winter than the first floor. A non-zoned system cannot completely accommodate this seasonal variation. Zoning, however, can reduce the wide variations in temperature between floors by supplying heating or cooling only to the space that needs it.

FIG. 2 shows one example of a conventional manually-controlled register vent 200. The register 200 includes one or more vanes 201 that can be opened or closed to adjust the amount of air that flows through the register 200. Diverters 202 direct the air in a desired direction (or directions). The vanes 201 are typically provided to a mechanical mechanism so that the occupants can manipulate the vanes 201 to control the amount of air that flows out of the register 200. In some registers, the diverters 202 are fixed. In some registers, the diverters 202 are moveable to allow the occupants some control over the direction of the airflow out of the vent. Registers such as the register 200 are found throughout homes that have a central HVAC system that provides heating and cooling air. Typically, relatively small rooms such as bedrooms and bathrooms will have one or two such register vents of varying sizes. Larger rooms, such as living rooms, family rooms, etc., may have more than two such registers. The occupants of a home can control the flow of air through each of the vents by manually adjusting the vanes 201. When the register vent is located on the floor, or relatively low on the wall, such adjustment is usually not particularly difficult (unless the mechanism that controls the vanes 201 is bent or rusted). However, adjustment of the vanes 201 can be very difficult when the register vent 200 is located so high on the wall that it cannot be easily reached.

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FIG. 3 shows one embodiment of an Electronically-Controlled Register Vent (ECRV) 300. The ECRV 300 can be used to implement a zoned heating and cooling system. The ECRV 300 can also be used as a remotely control register vent in places where the vent is located so high on the wall that it cannot be easily reached. The ECRV 300 is configured as a replacement for the vent 200. This greatly simplifies the task of retrofitting a home by replacing one or more of the register vents 200 with the ECRVs 300. In one embodiment, shown in FIG. 3, the ECRV 300 is configured to fit into approximately the same size duct opening as the conventional register vent 200. In one embodiment, the ECRV 300 is configured to fit over the duct opening used by the conventional register vent 200. In one embodiment, the ECRV 300 is configured to fit over the conventional register 200, thereby allowing the register 200 to be left in place. A control panel 301 provides one or more visual displays and, optionally, one or more user controls. A housing 302 is provided to house an actuator to control the vanes 201. In one embodiment, the housing 302 can also be used to house electronics, batteries, etc.

FIG. 4 is a block diagram of a self-contained ECRV 400, which is one embodiment of the ECRV 300 shown in FIGS. 3A and 3B and the ECRV shown in FIG. 18. In the ECRV 400, a temperature sensor 406 and a temperature sensor 416 are provided to a controller 401. The controller 401 controls an actuator system 409. In one embodiment, the actuator 409 provides position feedback to the controller 401. In one embodiment, the controller 401 reports actuator position to a central control system and/or zone thermostat. The actuator system 409 provides mechanical movements to control the airflow through the vent. In one embodiment, the actuator system 409 includes an actuator provided to the vanes 201 or other air-flow devices to control the amount of air that flows through the ECRV 400 (e.g., the amount of air that flows from the duct into the room). In one embodiment, an actuator system includes an actuator provided to one or more of the diverters 202 to control the direction of the airflow. The controller 401 also controls a visual display 403 and an optional fan 402. A user input device 408 is provided to allow the user to set the desired room temperature. An optional sensor 407 is provided to the controller 401. In one embodiment, the sensor 407 includes an air pressure and/or airflow sensor. In one embodiment, the sensor 407 includes a humidity sensor. A power source 404 provides power to the controller 401, the fan 402, the display 403, the temperature sensors 406, 416, the sensor 407, and the user input device 408 as needed. In one embodiment, the controller 401 controls the amount of power provided to the fan 402, the display 403, the sensor 406, the sensor 416, the sensor 407, and the user input device 408. In one embodiment, an optional auxiliary power source 405 is also provided to provide additional power. The auxiliary power source is a supplementary source of electrical power, such as, for example, a battery, a solar cell, an airflow (e.g., wind-powered) generator, the fan 402 acting as a generator, a nuclear-based electrical generator, a fuel cell, a thermocouple, etc.

In one embodiment, the power source 404 is based on a non-rechargeable battery and the auxiliary power source 405 includes a solar cell and a rechargeable battery. The controller 401 draws power from the auxiliary power source when possible to conserve power in the power source 404. When the auxiliary power source 405 is unable to provide sufficient power, then the controller 401 also draws power from the power source 404.

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In an alternative embodiment, the power source 404 is configured as a rechargeable battery and the auxiliary power source 405 is configured as a solar cell that recharges the power source 404.

In one embodiment, the display 403 includes a flashing indicator (e.g., a flashing LED or LCD) when the available power from the power sources 404 and/or 405 drops below a threshold level.

The home occupants use the user input device 408 to set a desired temperature for the vicinity of the ECRV 400. The display 403 shows the setpoint temperature. In one embodiment, the display 403 also shows the current room temperature. The temperature sensor 406 measures the temperature of the air in the room, and the temperature sensor 416 measures the temperature of the air in the duct. If the room temperature is above the setpoint temperature, and the duct air temperature is below the room temperature, then the controller 401 causes the actuator 409 to open the vent. If the room temperature is below the setpoint temperature, and the duct air temperature is above the room temperature, then the controller 401 causes the actuator 409 to open the vent. Otherwise, the controller 401 causes the actuator 409 to close the vent. In other words, if the room temperature is above or below the setpoint temperature and the temperature of the air in the duct will tend to drive the room temperature towards the setpoint temperature, then the controller 401 opens the vent to allow air into the room. By contrast, if the room temperature is above or below the setpoint temperature and the temperature of the air in the duct will not tend to drive the room temperature towards the setpoint temperature, then the controller 401 closes the vent.

In one embodiment, the controller 401 is configured to provide a few degrees of hysteresis (often referred to as a thermostat deadband) around the setpoint temperature in order to avoid wasting power by excessive opening and closing of the vent.

In one embodiment, the controller 401 turns on the fan 402 to pull additional air from the duct. In one embodiment, the fan 402 is used when the room temperature is relatively far from the setpoint temperature in order to speed the movement of the room temperature towards the setpoint temperature. In one embodiment, the fan 402 is used when the room temperature is changing relatively slowly in response to the open vent. In one embodiment, the fan 402 is used when the room temperature is moving away from the setpoint and the vent is fully open. The controller 401 does not turn on or run the fan 402 unless there is sufficient power available from the power sources 404, 405. In one embodiment, the controller 401 measures the power level of the power sources 404, 405 before turning on the fan 402, and periodically (or continually) when the fan is on.

In one embodiment, the controller 401 also does not turn on the fan 402 unless it senses that there is airflow in the duct (indicating that the HVAC air-handler fan is blowing air into the duct). In one embodiment, the sensor 407 includes an airflow sensor. In one embodiment, the controller 401 uses the fan 402 as an airflow sensor by measuring (or sensing) voltage generated by the fan 402 rotating in response to air flowing from the duct through the fan and causing the fan to act as a generator. In one embodiment, the controller 401 periodically stop the fan and checks for airflow from the duct.

In one embodiment, the sensor 406 includes a pressure sensor configured to measure the air pressure in the duct. In one embodiment, the sensor 406 includes a differential pressure sensor configured to measure the pressure difference between the air in the duct and the air outside the ECRV (e.g., the air in the room). Excessive air pressure in the duct is an

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indication that too many vents may be closed (thereby creating too much back pressure in the duct and reducing airflow through the HVAC system). In one embodiment, the controller 401 opens the vent when excess pressure is sensed.

The controller 401 conserves power by turning off elements of the ECRV 400 that are not in use. The controller 401 monitors power available from the power sources 404, 405. When available power drops below a low-power threshold value, the controller 401 moves the actuator 409 to an open position, activates a visual indicator using the display 403, and enters a low-power mode. In the low power mode, the controller 401 monitors the power sources 404, 405 but the controller does not provide zone control functions (e.g., the controller does not close the actuator 409). When the controller senses that sufficient power has been restored (e.g., through recharging of one or more of the power sources 404, 405) then the controller 401 resumes normal operation.

FIG. 5 is a block diagram of a self-contained ECRV 500 with a remote control interface 501. The ECRV 500 includes the power sources 404, 405, the controller 401, the fan 402, the display 403, the temperature sensors 406, 410, the sensor 407, and the user input device 408. The remote control interface 501 is provided to the controller 401, to allow the controller 401 to communicate with a remote control 502. The controller 502 sends wireless signals to the remote control interface 501 using wireless communication such as, for example, infrared communication, ultrasonic communication, and/or radio-frequency communication.

In one embodiment, the communication is one-way from the remote control 502 to the controller 401. The remote control 502 can be used to set the temperature set-point, to instruct the controller 401 to open or close the vent (either partially or fully), and/or to turn on the fan. In one embodiment, the communication between the remote control 502 and the controller 401 is two-way communication. Two-way communication allows the controller 401 to send information for display on the remote control 502, such as, for example, the current room temperature, the power status of the power sources 404, 405, diagnostic information, etc.

The ECRV 400 described in connection with FIG. 4, and the ECRV 500 described in connection with FIG. 5 are configured to operate as self-contained devices in a relatively stand-alone mode. If two ECRVs 400, 500 are placed in the same room or zone, the ECRVs 400, 500 will not necessarily operate in unison. FIG. 6 is a block diagram of a centrally-controlled zoned heating and cooling system 600 wherein a zone thermostat 601 monitors the temperature of a zone 608. ECRVs 602, 603 are configured to communicate with the zone thermostat 601. One embodiment of the ECRVs 602, 603 is shown, for example, in connection with FIG. 10. In one embodiment, the zone thermostat 601 sends control commands to the ECRVs 602-603 to cause the ECRVs 602-603 to open or close. In one embodiment, the zone thermostat 601 sends temperature information to the ECRVs 602-603 and the ECRVs 602-603 determine whether to open or close based on the temperature information received from the zone thermostat 601. In one embodiment, the zone thermostat 601 sends information regarding the current zone temperature and the setpoint temperature to the ECRVs 602-603.

In one embodiment, the ECRV 602 communicates with the ECRV 603 in order to improve the robustness of the communication in the system 600. Thus, for example, if the ECRV 602 is unable to communicate with the zone thermostat 601 but is able to communicate with the ECRV 603, then the ECRV 603 can act as a router between the ECRV 602 and the

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zone thermostat 601. In one embodiment, the ECRV 602 and the ECRV 603 communicate to arbitrate opening and closing of their respective vents.

The system 600 shown in FIG. 6 provides local control of a zone 608. Any number of independent zones can be controlled by replicating the system 600. FIG. 7A is a block diagram of a centrally-controlled zoned heating and cooling system wherein a central control system 710 communicates with one or more zone thermostats 707, 708 and one or more ECRVs 702-705. In the system 700, the zone thermostat 707 measures the temperature of a zone 711, and the ECRVs 702, 703 regulate air to the zone 711. The zone thermostat 708 measures the temperature of a zone 712, and the ECRVs 704, 705 regulate air to the zone 711. A central thermostat 720 controls the HVAC system 720.

FIG. 7B is a block diagram of a centrally-controlled zoned heating and cooling system 750 that is similar to the system 700 shown in FIG. 7A. In FIG. 7B, the central system 710 communicates with the zone thermostats 707, 708, the zone thermostat 707 communicates with the ECRVs 702, 703, the zone thermostat 708 communicates with the ECRVs 704, 705, and the central system 710 communicates with the ECRVs 706, 707. In the system 750, the ECRVs 702-705 are in zones that are associated with the respective zone thermostat 707, 708 that controls the respective ECRVs 702-705. The ECRVs 706, 707 are not associated with any particular zone thermostat and are controlled directly by the central system 710. One of ordinary skill in the art will recognize that the communication topology shown in FIG. 7B can also be used in connection with the system shown in FIGS. 8 and 9.

The central system 710 controls and coordinates the operation of the zones 711 and 712, but the system 710 does not control the HVAC system 721. In one embodiment, the central system 710 operates independently of the thermostat 720. In one embodiment, the thermostat 720 is provided to the central system 710 so that the central system 710 knows when the thermostat is calling for heating, cooling, or fan.

The central system 710 coordinates and prioritizes the operation of the ECRVs 702-705. In one embodiment, the home occupants can provide a priority schedule for the zones 711, 712 based on whether the zones are occupied, the time of day, the time of year, etc. Thus, for example, if zone 711 corresponds to a bedroom and zone 712 corresponds to a living room, zone 711 can be given a relatively lower priority during the day and a relatively higher priority during the night. As a second example, if zone 711 corresponds to a first floor, and zone 712 corresponds to a second floor, then zone 712 can be given a higher priority in summer (since upper floors tend to be harder to cool) and a lower priority in winter (since lower floors tend to be harder to heat). In one embodiment, the occupants can specify a weighted priority between the various zones.

Closing too many vents at one time is often a problem for central HVAC systems as it reduces airflow through the HVAC system, and thus reduces efficiency. The central system 710 can coordinate how many vents are closed (or partially closed) and thus, ensure that enough vents are open to maintain proper airflow through the system. The central system 710 can also manage airflow through the home such that upper floors receive relatively more cooling air and lower floors receive relatively more heating air.

FIG. 8 is a block diagram of a centrally-controlled zoned heating and cooling system 800. The system 800 is similar to the system 700 and includes the zone thermostats 707, 708 to monitor the zones 711, 712, respectively, and the ECRVs 702-705. The zone thermostats 707, 708 and/or the ECRVs 702-705 communicate with a central controller 810. In the

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system 800, the thermostat 720 is provided to the central system 810 and the central system 810 controls the HVAC system 721 directly.

The controller 810 provides similar functionality as the controller 710. However, since the controller 810 also controls the operation of the HVAC system 721, the controller 810 is better able to call for heating and cooling as needed to maintain the desired temperature of the zones 711, 712. If all, or substantially all, of the home is served by the zone thermostats and ECRVs, then the central thermostat 720 can be eliminated.

In some circumstances, depending on the return air paths in the house, the controller 810 can turn on the HVAC fan (without heating or cooling) to move air from zones that are too hot to zones that are too cool (or vice versa) without calling for heating or cooling. The controller 810 can also provide for efficient use of the HVAC system by calling for heating and cooling as needed, and delivering the heating and cooling to the proper zones in the proper amounts. If the HVAC system 721 provides multiple operating modes (e.g., high-speed, low-speed, etc.), then the controller 810 can operate the HVAC system 721 in the most efficient mode that provides the amount of heating or cooling needed.

FIG. 9 is a block diagram of an efficiency-monitoring centrally-controlled zoned heating and cooling system 900. The system 900 is similar to the system 800, in the system 900 the controller 810 is replaced by an efficiency-monitoring controller 910 that is configured to receive sensor data (e.g., system operating temperatures, etc.) from the HVAC system 721 to monitor the efficiency of the HVAC system 721.

FIG. 10 is a block diagram of an ECRV 1000 for use in connection with the systems shown in FIGS. 6-9. The ECRV 1000 includes the power sources 404, 405, the controller 401, the fan 402, the display 403, and, optionally, the temperature sensors 416 and the sensor 407, and the user input device 408. A communication system 1081 is provided to the controller 401. The remote control interface 501 is provided to the controller 401, to allow the controller 401 to communicate with a remote control 502. The controller 502 sends wireless signals to the remote control interface 501 using wireless communication such as, for example, infrared communication, ultrasonic communication, and/or radio-frequency communication.

The communication system 1081 is configured to communicate with the zone thermostat and, optionally, with the central controllers 710, 810, 910. In one embodiment, the communication system 1081 is configured to communicate using wireless communication such as, for example, infrared communication, radio communication, or ultrasonic communication.

FIG. 11 is a block diagram of a basic zone thermostat 1100 for use in connection with the systems shown in FIGS. 6-9. In the zone thermostat 1100, a temperature sensor 1102 is provided to a controller 1101. User input controls 1103 are also provided to the controller 1101 to allow the user to specify a setpoint temperature. A visual display 1110 is provided to the controller 1101. The controller 1101 uses the visual display 1110 to show the current temperature, setpoint temperature, power status, etc. The communication system 1181 is also provided to the controller 1101. The power source 404 and, optionally, 405 are provided to provide power for the controller 1100, the controls 1103, the sensor 1102, the communication system 1181, and the visual display 1110.

In systems where a central controller 710, 810, 910 is used, the communication method used by the zone thermostat 1100 to communicate with the ECRV 1000 need not be the same method used by the zone thermostat 1100 to communicate

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with the central controller 710, 810, 910. Thus, in one embodiment, the communication system 1181 is configured to provide one type of communication (e.g., infrared, radio, ultrasonic) with the central controller, and a different type of communication with the ECRV 1000.

In one embodiment, the zone thermostat is battery powered. In one embodiment, the zone thermostat is configured into a standard light switch and receives electrical power from the light switch circuit.

FIG. 12 is a block diagram of a zone thermostat 1200 with remote control for use in connection with the systems shown in FIGS. 6-9. The thermostat 1200 is similar to the thermostat 1100 and includes, the temperature sensor 1102, the input controls 1103, the visual display 1110, the communication system 1181, and the power sources 404, 405. In the zone thermostat 1200, the remote control interface 501 is provided to the controller 1101.

In one embodiment, an occupant sensor 1201 is provided to the controller 1101. The occupant sensor 1201, such as, for example, an infrared sensor, motion sensor, ultrasonic sensor, etc., senses when the zone is occupied. The occupants can program the zone thermostat 1201 to bring the zone to different temperatures when the zone is occupied and when the zone is empty. In one embodiment, the occupants can program the zone thermostat 1201 to bring the zone to different temperatures depending on the time of day, the time of year, the type of room (e.g., bedroom, kitchen, etc.), and/or whether the room is occupied or empty. In one embodiment, a group of zones are combined into a composite zone (e.g., a group of zones such as an entire house, an entire floor, an entire wing, etc.) and the central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied.

FIG. 13 shows one embodiment of a central monitoring station console 1300 for accessing the functions represented by the blocks 710, 810, 910 in FIGS. 7, 8, 9, respectively. The station 1300 includes a display 1301 and a keypad 1302. The occupants can specify zone temperature settings, priorities, and thermostat deadbands using the central system 1300 and/or the zone thermostats. In one embodiment, the console 1300 is implemented as a hardware device. In one embodiment, the console 1300 is implemented in software as a computer display, such as, for example, on a personal computer. In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor, and the control system processor interfaces with personal computer to provide the console 1300 on the personal computer. In one embodiment, the zone control functions of the blocks 710, 810, 910 are provided by a computer program running on a control system processor provided to a hardware console 1300. In one embodiment, the occupants can use the Internet, telephone, cellular telephone, pager, etc., to remotely access the central system to control the temperature, priority, etc., of one or more zones.

FIG. 14 is a flowchart showing one embodiment of an instruction loop process 1400 for an ECRV or zone thermostat. The process 1400 begins at a power-up block 1401. After power up, the process proceeds to an initialization block 1402. After initialization, the process advances to a "listen" block 1403 wherein the ECRV or zone thermostat listens for one or more instructions. If a decision block 1404 determines that an instruction has been received, then the process advances to a "perform instruction" block 1405, otherwise the process returns to the listen block 1403.

For an ECRV, the instructions can include: open vent, close vent, open vent to a specified partially-open position, report sensor data (e.g., airflow, temperature, etc.), report status

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(e.g., battery status, vent position, etc.), and the like. For a zone thermostat, the instructions can include: report temperature sensor data, report temperature rate of change, report setpoint, report status, etc. In systems where the central system communicates with the ECRVs through a zone thermostat, the instructions can also include: report number of ECRVs, report ECRV data (e.g., temperature, airflow, etc.), report ECRV vent position, change ECRV vent position, etc.

In one embodiment, the listen block 1403 consumes relatively little power, thereby allowing the ECRV or zone thermostat to stay in the loop corresponding to the listen block 1403 and conditional branch 1404 for extended periods of time.

Although the listen block 1403 can be implemented to use relatively little power, a sleep block can be implemented to use even less power. FIG. 15 is a flowchart showing one embodiment of an instruction and sensor data loop process 1500 for an ECRV or zone thermostat. The process 1500 begins in a power-up block 1501. After power up, the process proceeds to an initialization block 1502. After initialization, the process advances to a "sleep" block 1503 wherein the ECRV or zone thermostat sleeps for a specified period of time. When the sleep period expires, the process advances to a wakeup block 1504 and then to a decision 1505. In the decision block 1505, if a fault is detected, then a transmit fault block 1506 is executed. The process then advances to a sensor block 1507 where sensor readings are taken. After taking sensor readings, the process advances to a listen-for-instructions block 1508. If an instruction has been received, then the process advances to a "perform instruction" block 1510; otherwise, the process returns to the sleep block 1503.

FIG. 16 is a flowchart showing one embodiment of an instruction and sensor data reporting loop process 1600 for an ECRV or zone thermostat. The process 1600 begins at a power-up block 1601. After power up, the process proceeds to an initialization block 1602. After initialization, the process advances to a check fault block 1603. If a fault is detected then a decision block 1604 advances the process to a transmit fault block 1605; otherwise, the process advances to a sensor block 1606 where sensor readings are taken. The data values from one or more sensors are evaluated, and if the sensor data is outside a specified range, or if a timeout period has occurred, then the process advances to a transmit data block 1608; otherwise, the process advances to a sleep block 1609. After transmitting in the transmit fault block 1605 or the transmit sensor data block 1608, the process advances to a listen block 1610 where the ECRV or zone thermostat listens for instructions. If an instruction is received, then a decision block advances the process to a perform instruction block 1612; otherwise, the process advances to the sleep block 1609. After executing the perform instruction block 1612, the process transmits an "instruction complete message" and returns to the listen block 1610.

The process flows shown in FIGS. 14-16 show different levels of interaction between devices and different levels of power conservation in the ECRV and/or zone thermostat. One of ordinary skill in the art will recognize that the ECRV and zone thermostat are configured to receive sensor data and user inputs, report the sensor data and user inputs to other devices in the zone control system, and respond to instructions from other devices in the zone control system. Thus the process flows shown in FIGS. 14-16 are provided for illustrative purposes and not by way of limitation. Other data reporting and instruction processing loops will be apparent to those of ordinary skill in the art by using the disclosure herein.

In one embodiment, the ECRV and/or zone thermostat "sleep" between sensor readings. In one embodiment, the

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central system 710 sends out a "wake up" signal. When an ECRV or zone thermostat receives a wake up signal, it takes one or more sensor readings, encodes it into a digital signal, and transmits the sensor data along with an identification code.

In one embodiment, the ECRV is bi-directional and configured to receive instructions from the central system. Thus, for example, the central system can instruct the ECRV to: perform additional measurements; go to a standby mode; wake up; report battery status; change wake-up interval; run self-diagnostics and report results; etc.

In one embodiment, the ECRV provides two wake-up modes, a first wake-up mode for taking measurements (and reporting such measurements if deemed necessary), and a second wake-up mode for listening for commands from the central system. The two wake-up modes, or combinations thereof, can occur at different intervals.

In one embodiment, the ECRVs use spread-spectrum techniques to communicate with the zone thermostats and/or the central system. In one embodiment, the ECRVs use frequency-hopping spread-spectrum. In one embodiment, each ECRV has an identification code (ID) and the ECRVs attaches its ID to outgoing communication packets. In one embodiment, when receiving wireless data, each ECRV ignores data that is addressed to other ECRVs.

In one embodiment, the ECRV provides bi-directional communication and is configured to receive data and/or instructions from the central system. Thus, for example, the central system can instruct the ECRV to perform additional measurements, to go to a standby mode, to wake up, to report battery status, to change wake-up interval, to run self-diagnostics and report results, etc. In one embodiment, the ECRV reports its general health and status on a regular basis (e.g., results of self-diagnostics, battery health, etc.).

In one embodiment, the ECRVs use spread-spectrum techniques to communicate with the central system. In one embodiment, the ECRV uses frequency-hopping spread-spectrum. In one embodiment, the ECRV has an address or identification (ID) code that distinguishes the ECRV from the other ECRVs. The ECRV attaches its ID to outgoing communication packets so that transmissions from the ECRV can be identified by the central system. The central system attaches the ID of the ECRV to data and/or instructions that are transmitted to the ECRV. In one embodiment, the ECRV ignores data and/or instructions that are addressed to other ECRVs.

In one embodiment, the ECRVs, zone thermostats, central system, etc., communicate on a 900 MHz frequency band. This band provides relatively good transmission through walls and other obstacles normally found in and around a building structure. In one embodiment, the ECRVs and zone thermostats communicate with the central system on bands above and/or below the 900 MHz band. In one embodiment, the ECRVs and zone thermostats listen to a radio frequency channel before transmitting on that channel or before beginning transmission. If the channel is in use, (e.g., by another device such as another central system, a cordless telephone, etc.) then the ECRVs and/or zone thermostats change to a different channel. In one embodiment, the sensor, central system coordinates frequency hopping by listening to radio frequency channels for interference and using an algorithm to select a next channel for transmission that avoids the interference. In one embodiment, the ECRV and/or zone thermostat transmits data until it receives an acknowledgement from the central system that the message has been received.

Frequency-hopping wireless systems offer the advantage of avoiding other interfering signals and avoiding collisions. Moreover, there are regulatory advantages given to systems

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that do not transmit continuously at one frequency. Chirp-hopping transmitters change frequencies after a period of continuous transmission, or when interference is encountered. These systems may have higher transmit power and relaxed limitations on in-band spurs.

In one embodiment, the controller 401 reads the sensors 406, 407, 416 at regular periodic intervals. In one embodiment, the controller 401 reads the sensors 406, 407, 416 at random intervals. In one embodiment, the controller 401 reads the sensors 406, 407, 416 in response to a wake-up signal from the central system. In one embodiment, the controller 401 sleeps between sensor readings.

In one embodiment, the ECRV transmits sensor data until a handshaking-type acknowledgement is received. Thus, rather than sleep if no instructions or acknowledgements are received after transmission (e.g., after the instruction block 1510, 1405, 1612 and/or the transmit blocks 1605, 1608) the ECRV retransmits its data and waits for an acknowledgement. The ECRV continues to transmit data and wait for an acknowledgement until an acknowledgement is received. In one embodiment, the ECRV accepts an acknowledgement from a zone thermometer and it then becomes the responsibility of the zone thermometer to make sure that the data is forwarded to the central system. The two-way communication ability of the ECRV and zone thermometer provides the capability for the central system to control the operation of the ECRV and/or zone thermometer and also provides the capability for robust handshaking-type communication between the ECRV, the zone thermometer, and the central system.

In one embodiment of the system 600 shown in FIG. 6, the ECRVs 602, 603 send duct temperature data to the zone thermostat 601. The zone thermostat 601 compares the duct temperature to the room temperature and the setpoint temperature and makes a determination as to whether the ECRVs 602, 603 should be open or closed. The zone thermostat 601 then sends commands to the ECRVs 602, 603 to open or close the vents. In one embodiment, the zone thermostat 601 displays the vent position on the visual display 1110.

In one embodiment of the system 600 shown in FIG. 6, the zone thermostat 601 sends setpoint information and current room temperature information to the ECRVs 602, 603. The ECRVs 602, 603 compare the duct temperature to the room temperature and the setpoint temperature and makes a determination as to whether to open or close the vents. In one embodiment, the ECRVs 602, 603 send information to the zone thermostat 601 regarding the relative position of the vents (e.g., open, closed, partially open, etc.).

In the systems 700, 750, 800, 900 (the centralized systems) the zone thermostats 707, 708 send room temperature and setpoint temperature information to the central system. In one embodiment, the zone thermostats 707, 708 also send temperature slope (e.g., temperature rate of rise or fall) information to the central system. In the systems where the thermostat 730 is provided to the central system or where the central system controls the HVAC system, the central system knows whether the HVAC system is providing heating or cooling; otherwise, the central system uses duct temperature information provided by the ECRVs 702-705 to determine whether the HVAC system is heating or cooling. In one embodiment, ECRVs send duct temperature information to the central system. In one embodiment, the central system queries the ECRVs by sending instructions to one or more of the ECRVs 702-705 instructing the ECRV to transmit its duct temperature.

The central system determines how much to open or close ECRVs 702-705 according to the available heating and cooling capacity of the HVAC system and according to the priority

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of the zones and the difference between the desired temperature and actual temperature of each zone. In one embodiment, the occupants use the zone thermostat 707 to set the setpoint and priority of the zone 711, the zone thermostat 708 to set the setpoint and priority of the zone 712, etc. In one embodiment, the occupants use the central system console 1300 to set the setpoint and priority of each zone, and the zone thermostats to override (either on a permanent or temporary basis) the central settings. In one embodiment, the central console 1300 displays the current temperature, setpoint temperature, temperature slope, and priority of each zone.

In one embodiment, the central system allocates HVAC air to each zone according to the priority of the zone and the temperature of the zone relative to the setpoint temperature of the zone. Thus, for example, in one embodiment, the central system provides relatively more HVAC air to relatively higher priority zones that are not at their temperature setpoint than to lower priority zones or zones that are at or relatively near their setpoint temperature. In one embodiment, the central system avoids closing or partially closing too many vents in order to avoid reducing airflow in the duct below a desired minimum value.

In one embodiment, the central system monitors a temperature rate of rise (or fall) in each zone and sends commands to adjust the amount each ECRV 702-705 is open to bring higher priority zones to a desired temperature without allowing lower-priority zones to stray too far from their respective setpoint temperature.

In one embodiment, the central system uses predictive modeling to calculate an amount of vent opening for each of the ECRVs 702-705 to reduce the number of times the vents are opened and closed and thereby reduce power usage by the actuators 409. In one embodiment, the central system uses a neural network to calculate a desired vent opening for each of the ECRVs 702-705. In one embodiment, various operating parameters such as the capacity of the central HVAC system, the volume of the house, etc., are programmed into the central system for use in calculating vent openings and closings. In one embodiment, the central system is adaptive and is configured to learn operating characteristics of the HVAC system and the ability of the HVAC system to control the temperature of the various zones as the ECRVs 702-705 are opened and closed. In an adaptive learning system, as the central system controls the ECRVs to achieve the desired temperature over a period of time, the central system learns which ECRVs need to be opened, and by how much, to achieve a desired level of heating and cooling for each zone. The use of such an adaptive central system is convenient because the installer is not required to program HVAC operating parameters into the central system. In one embodiment, the central system provides warnings when the HVAC system appears to be operating abnormally, such as, for example, when the temperature of one or more zones does not change as expected (e.g., because the HVAC system is not operating properly, a window or door is open, etc.).

In one embodiment, the adaptation and learning capability of the central system uses different adaptation results (e.g., different coefficients) based on whether the HVAC system is heating or cooling, the outside temperature, a change in the setpoint temperature or priority of the zones, etc. Thus, in one embodiment, the central system uses a first set of adaptation coefficients when the HVAC system is cooling, and a second set of adaptation coefficients when the HVAC system is heating. In one embodiment, the adaptation is based on a predictive model. In one embodiment, the adaptation is based on a neural network.

FIG. 17 shows an ECRV 1700 configured to be used in connection with a conventional T-bar ceiling system found in many commercial structures. In the ECRV 1700, an actuator 1701 (as one embodiment of the actuator 409) is provided to a damper 1702. The damper 1702 is provided to a diffuser 1703 that is configured to mount in a conventional T-bar ceiling system. The ECRV 1700 can be connected to a zoned thermostat or central system by wireless or wired communication.

In one embodiment, the sensors 407 in the ECRVs include airflow and/or air velocity sensors. Data from the sensors 407 are transmitted by the ECRV to the central system. The central system uses the airflow and/or air velocity measurements to determine the relative amount of air through each ECRV. Thus, for example, by using airflow/velocity measurements, the control system can adapt to the relatively lower airflow of smaller ECRVs and ECRVs that are situated on the duct further from the HVAC blower than ECRVs which are located closer to the blower (the closer ECRVs tend to receive more airflow).

In one embodiment, the sensors 407 include humidity sensors. In one embodiment, the zone thermostat 1100 includes a zone humidity sensor provided to the controller 1101. The zone control system (e.g., the central system, the zone thermostat, and/or ECRV) uses humidity information from the humidity sensors to calculate zone comfort values and to adjust the temperature setpoint according to a comfort value. Thus, for example, in one embodiment during a summer cooling season, the zone control system lowers the zone temperature setpoint during periods of relative high humidity, and raises the zone setpoint during periods of relatively low humidity. In one embodiment, the zone thermostat allows the occupants to specify a comfort setting based on temperature and humidity. In one embodiment, the zone control system controls the HVAC system to add or remove humidity from the heating/cooling air.

FIG. 18 shows a register vent 1800 configured to use a scrolling curtain 1801 to control airflow as an alternative to the vanes shown in FIGS. 2 and 3. An actuator 1802 (one embodiment of the actuator 409) is provided to the curtain 1801 to move the curtain 1801 across the register to control the size of a register airflow opening. In one embodiment, the curtain 1801 is guided and held in position by a track 1803.

In one embodiment, the actuator 1802 is a rotational actuator and the scrolling curtain 1801 is rolled around the actuator 1802, and the register vent 1800 is open and rigid enough to be pushed into the vent opening by the actuator 1802 when the actuator 1802 rotates to unroll the curtain 1801.

In one embodiment, the actuator 1802 is a rotational actuator and the scrolling curtain 1801 is rolled around the actuator 1802, and the register vent 1800 is open and rigid enough to be pushed into the vent opening by the actuator 1802 when the actuator 1802 rotates to unroll the curtain 1801. In one embodiment, the actuator 1802 is configured to

FIG. 19 is a block diagram of a control algorithm 1900 for controlling the register vents. For purposes of explanation, and not by way of limitation, the algorithm 1900 is described herein as running on the central system. However, one of ordinary skill in the art will recognize that the algorithm 1900 can be run by the central system, by the zone thermostat, by the ECRV, or the algorithm 1900 can be distributed among the central system, the zone thermostat, and the ECRV. In the algorithm 1900, in a block 1901 of the algorithm 1900, the setpoint temperatures from one or more zone thermostats are provided to a calculation block 1902. The calculation block 1902 calculates the register vent settings (e.g., how much to open or close each register vent) according to the zone tem-

perature, the zone priority, the available heating and cooling air, the previous register vent settings, etc., as described above. In one embodiment, the block 1902 uses a predictive model as described above. In one embodiment, the block 1902 calculates the register vent settings for each zone independently (e.g., without regard to interactions between zones). In one embodiment, the block 1902 calculates the register vent settings for each zone in a coupled-zone manner that includes interactions between zones. In one embodiment, the calculation block 1902 calculates new vent openings by taking into account the current vent openings and in a manner configured to minimize the power consumed by opening and closing the register vents.

Register vent settings from the block 1902 are provided to each of the register vent actuators in a block 1903, wherein the register vents are moved to new opening positions as desired (and, optionally, one or more of the fans 402 are turned on to pull additional air from desired ducts). After setting the new vent openings in the block 1903, the process advances to a block 1904 where new zone temperatures are obtained from the zone thermostats (the new zone temperatures being responsive to the new register vent settings made in block 1903). The new zone temperatures are provided to an adaptation input of the block 1902 to be used in adapting a predictive model used by the block 1902. The new zone temperatures also provided to a temperature input of the block 1902 to be used in calculating new register vent settings.

As described above, in one embodiment, the algorithm used in the calculation block 1902 is configured to predict the ECRV opening needed to bring each zone to the desired temperature based on the current temperature, the available heating and cooling, the amount of air available through each ECRV, etc. The calculating block uses the prediction model to attempt to calculate the ECRV openings needed for relatively long periods of time in order to reduce the power consumed in unnecessarily by opening and closing the register vents. In one embodiment, the ECRVs are battery powered, and thus reducing the movement of the register vents extends the life of the batteries. In one embodiment, the block 1902 uses a predictive model that learns the characteristics of the HVAC system and the various zones and thus the model prediction tends to improve over time.

In one embodiment, the zone thermostats report zone temperatures to the central system and/or the ECRVs at regular intervals. In one embodiment, the zone thermostats report zone temperatures to the central system and/or the ECRVs after the zone temperature has changed by a specified amount specified by a threshold value. In one embodiment, the zone thermostats report zone temperatures to the central system and/or the ECRVs in response to a request instruction from the central system or ECRV.

In one embodiment, the zone thermostats report setpoint temperatures and zone priority values to the central system or ECRVs whenever the occupants change the setpoint temperatures or zone priority values using the user controls 1102. In one embodiment, the zone thermostats report setpoint temperatures and zone priority values to the central system or ECRVs in response to a request instruction from the central system or ECRVs.

In one embodiment, the occupants can choose the thermostat deadband value (e.g., the hysteresis value) used by the calculation block 1902. A relatively larger deadband value reduces the movement of the register vent at the expense of larger temperature variations in the zone.

In one embodiment, the ECRVs report sensor data (e.g., duct temperature, airflow, air velocity, power status, actuator position, etc.) to the central system and/or the zone thermo-

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stats at regular intervals. In one embodiment, the ECRVs report sensor data to the central system and/or the zone thermostats whenever the sensor data fails a threshold test (e.g., exceeds a threshold value, falls below a threshold value, falls inside a threshold range, or falls outside a threshold range, etc.). In one embodiment, the ECRVs report sensor data to the central system and/or the zone thermostats in response to a request instruction from the central system or zone thermostat.

In one embodiment, the central system is shown in FIGS. 7-9 is implemented in a distributed fashion in the zone thermostats 1100 and/or in the ECRVs. In the distributed system, the central system does not necessarily exist as a distinct device; rather, the functions of the central system can be distributed in the zone thermostats 1100 and/or the ECRVs. Thus, in a distributed system, FIGS. 7-9 represent a conceptual/computational model of the system. For example, in a distributed system, each zone thermostat 100 knows its zone priority, and the zone thermostats 1100 in the distributed system negotiate to allocate the available heating/cooling air among the zones. In one embodiment of a distributed system, one of the zone thermostats assumes the role of a master thermostat that collects data from the other zone thermostats and implements the calculation block 1902. In one embodiment of a distributed system, the zone thermostats operate in a peer-to-peer fashion, and the calculation block 1902 is implemented in a distributed manner across a plurality of zone thermostats and/or ECRVs.

In one embodiment, the fan 402 can be used as generators to provide power to recharge the power source 404 in the ECRV. However, using the fan 402 in such a manner restricts airflow through the ECRV. In one embodiment, the controller 401 calculates a vent opening for the ECRV to produce the desired amount of air through the ECRV while using the fan to generate power to recharge the power source 404 (that, in such circumstance, the controller would open the vanes more than otherwise necessary in order to compensate for the air resistance of the generator fan 402). In one embodiment, in order to save power in the ECRV, rather than increase the vent opening, the controller 401 can use the fan as a generator. The controller 401 can direct the power generated by the fan 402 into one or both of the power sources 404, 405, or the controller 401 can dump the excess power from the fan into a resistive load. In one embodiment, the controller 401 makes decisions regarding vent opening versus fan usage. In one embodiment, the central system instructs the controller 401 when to use the vent opening and when to use the fan. In one embodiment, the controller 401 and central system negotiate vent opening versus fan usage.

In one embodiment, the ECRV reports its power status to the central system or zone thermostat. In one embodiment the central system or zone thermostat takes such power status into account when determining how ECRV openings. Thus, for example, if there are first and second ECRVs serving one zone and the central system knows that the first ECRV is low on power, the central system will use the second ECRV to mediate the air into the zone. If the first ECRV is able to use the fan 402 or other airflow-based generator to generate electrical power, the central system will instruct the second ECRV to a relatively closed position in and direct relatively more inflow through the first ECRV when directing air into the zone.

FIGS. 20 and 21 show one embodiment of an Electronically-Controlled Register Vent (ECRV) 2000 having a slotted sliding member 2001 to provide opening and closing of the vent. The ECRV 2000 includes the control panel 301 and housing 302. The sliding member 2001 has a plurality of openings that approximately match vent openings. When the

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sliding member 2001 is positioned in the open position, the opening in the sliding member approximately match the openings in the vent and air can pass through the openings. When the sliding member 2001 is positioned in the closed position, the slots between openings in the sliding member approximately match the openings in the vent and airflow is blocked. Thus, relatively little travel is needed in the sliding member 2001 in order to provide full open, full close, or partial opening between full open or full close.

The ECRV 2000 is similar in function to the ECRV 300 as described, for example, in connection with FIGS. 4-6 and 19. Like the ECRV 300, the ECRV 2001 can be used to implement a zoned heating and cooling system. The ECRV 2000 can also be used as a remotely controlled register vent in places where the vent is located so high on the wall that it cannot be easily reached. The ECRV 2000 is configured as a replacement for the vent 200. This simplifies the task of retrofitting a house by replacing one or more of the register vent, 200 with the ECRVs 2000 and/or ECRVs 300. In one embodiment, shown in FIGS. 20 and 21, the ECRV 300 is configured to fit into approximately the same size duct opening as the conventional register vent 200. In one embodiment, the ECRV 2000 is configured to fit over the duct opening used by the conventional register vent 200. In one embodiment, the ECRV 2000 is configured to fit over the conventional register vent 200 (as shown, for example, in FIGS. 22 and 23), thereby allowing the register 200 to be left in place. The control panel 301 provides one or more visual displays and, optionally, one or more user controls. The housing 302 is provided to house an actuator (e.g., motor, solenoid, etc.) to control the sliding member 2001. In one embodiment, the housing 302 can also be used to house electronics, batteries, etc.

FIGS. 22 and 23 show an electronically-controlled register vent 2200 configured to fit over a vent opening. The ECRV 2200 is similar in function to the ECRV 300 and ECRV 2000 as described, for example, in connection with FIGS. 4-6 and 19. In the ECRV 2200, the control panel 301 and housing 302 are placed beside or above the vent opening and thus, do not block any of the airflow through the vent opening. The ECRV 2200 can be used in place of the ECRV 300 or ECRV 2000, and is particularly useful when the vent opening is relatively small since the electronics and actuator housing 302 are not blocking air flowing through the vent.

In one embodiment, control of the zone heating and cooling system as shown, for example, in FIGS. 6-9 provides budgeting and/or rationing of heating and cooling. The zone thermostats 601, 707, 708, and/or central system 710, 810, or 910 provide heating and/or cooling as the budget allows. The discussion that follows describes such rationing or budgeting in connection with the central system 810 by way of example and is not limiting. One of ordinary skill in the art upon reading the present specification will recognize that budgeting and/or rationing can be implemented by zone thermostats 601, 707, 708, and/or central system 710, 810, or 910 working together or independently. Further, in the discussion that follows, a monthly budget period is described. One of ordinary skill in the art upon reading the present disclosure will recognize that budget periods of less than a month or more than a month can be used. The one month period is generally convenient because energy bills (e.g., electricity, natural gas, etc.) are generally paid monthly. However, other energy bills, such as, for example, heating oil, propane, etc., are not necessarily monthly. Moreover, some utilities, such as, for example, natural gas utilities, have payment plans that provide a fixed monthly payment throughout the year. Thus, the budgeting period can be seasonal (e.g., the heating season, cooling season, etc.), annual, semi-annual, weekly, etc.

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In one embodiment, the control system 810 calculates the amount of energy used and/or the cost of such energy during a desired budget period (e.g., a month). The control system 810 can adjust temperatures and the amount of heating and cooling to try and stay within a desired budget. Thus, for example, during a period of cold weather, when heating costs are high, the control system 810 can provide relatively less heat during the later part of the budget period in order to try and keep heating costs within budget. In one embodiment, the control system 810 budgets heating use according to the expected weather during the budget period. In one embodiment, the control system 810 is connected to a communication system (e.g., the telephone system, the Internet, a wireless service, etc.) and receives weather predictions. The control system 810 can then budget heating and cooling according to expected weather patterns. For example, if early in a budget period the control system 810 receives a prediction that unusually cold weather is expected later in the budget period, the control system 810 can reduce heating during the early part of the budget period in order to provide more heating later during the budget period and still try to stay within budget.

Since the control system 810 can control various ECRVs (and/or dampers, in water) to direct heating and cooling to various zones, the control system 810 can adjust the temperature of the various zones in order to try and stay within the allowed budget. When the control system reduces heating or cooling due to budget constraints, the system 810 will typically first reduce heating or cooling to the lower priority zones. In one embodiment, the user can set temperature ranges (either directly to the control system 810 or using the zone thermostats). Thus, the user can set a desired setpoint temperature for a particular zone, and allowed temperature variations (e.g., maximum temperature, and minimum temperature). Typically, the allowed variations will be relatively smaller in higher priority zones (e.g., a nursery) and relatively larger in lower priority zones (e.g., a rarely-used formal dining room). The control system 810 will then try to keep the temperature in each zone near the desired setpoint temperature as the budget allows. However, if the weather turns cold, the control system 810 can allow the temperatures to drop in the various zones in order to try and stay within budget. Thus, the temperature in the lower-priority zones will be allowed to fall more than the temperature in the higher priority zones. For cooling, the control system 810 would allow temperatures to rise within the set limits. In one embodiment, the user can set the zone priority, setpoint temperature, and temperature ranges according to time of day, day of the week, month of the year, etc. In one embodiment, the user can set different setpoint, minimum and maximum temperatures for occupied zones and unoccupied zones. In one embodiment, the control system 810 is provided to a communication network (e.g., telephone network, Internet, etc.) to allow the user to remotely set and monitor the temperatures in various zones.

In addition to the desired setpoint, minimum, and maximum temperatures discussed above, the user can also specify absolute minimum or maximum temperatures. The absolute minimum and maximum temperatures are the temperature at which the control system 810 is directed to provide heating and cooling regardless of budget. For example, the user would typically specify an absolute minimum temperature at least high enough above freezing in order to prevent frozen plumbing and probably high enough above freezing to prevent hypothermia of the occupants. In one embodiment, the user can specify different absolute minimum temperatures for occupied and unoccupied zones.

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In one embodiment, the control system 810 uses data from occupant sensors, such as, for example, the occupant sensor 501 to adjust temperatures in connection with budgeting. In such an embodiment, the control system 810 will allow the temperature in unoccupied areas of the building to fall relatively closer to their minimum allowed value while temperatures in occupied areas of the building would be held closer to their desired values. In one embodiment, the control system 810 calculates the priority of a particular zone according to whether the zone is occupied or not. The priority of a zone rises when the zone is occupied and falls when the zone is not occupied. In one embodiment, the control system 810 uses a predictive model to compute zone priorities based on when the zone is typically occupied. The user can set the base value for each zone and the amount that the zone priority rises when the zone is occupied or falls when the zone is unoccupied.

In one embodiment, the control system 810 calculates energy (e.g., cost for electricity, fuel, etc.) based on numbers provided by the user. In one embodiment, the control system 810 calculates energy cost per unit (e.g., cost per kilowatt-hour for electricity, cost per gallon fuel, etc.) based on numbers provided by the utility (e.g., via the communication network). In one embodiment, the control system 810 computes expected fuel costs based on current energy costs, historical patterns, etc.

In one embodiment, the control system 810 also provides energy cost predictions so that the user can make financial arrangements in advance should the need arise to exceed the budget. Thus, if an unusually prolonged period of cold weather causes the control system 810 to provide heating beyond the allowed budget, the system 810 can warn the user in advance and thus, allows the user to make adjustments (e.g., reduce other expenses, find other sources of heating, close off rooms, etc.).

The user can also specify the extent to which the control system 810 is to try and stay within the allowed budget. If the user specifies that the budget is very important, then the control system will allow temperatures to approach or reach their assigned minimum and maximum values in order to stay within the budget. By contrast, if the user specifies that the budget is not very important, then the control system will bias temperatures toward their assigned minimum and maximum values but will allow the budget to be exceeded rather than allow temperatures to reach their minimum or maximum values (at least for any length of time).

In one embodiment, the zone thermostats 601, 707, 708, and/or central system 710, 810, or 910 provide diagnostic information to the user. For example, if temperature in one zone typically lags other zones even when vents for that zone are open, the system will report the presence of the lagging zone and thus allow the user to add vents, add booster fans, change the setpoint temperature of the lagging zone, etc. Moreover, in one embodiment, if the zone system is routinely keeping the HVAC system running to bring a lagging zone to temperature, the zone system can calculate and report the additional energy used and/or cost due to the lagging zone. The control system 710, 810, 910 can also suggest which zones (or which vents) would benefit from a booster fan. In one embodiment, the control system 710, 810, 910 can use data from the zone thermostat and/or ECRVs to diagnose non-HVAC heating/cooling issues, such as, for example, open windows, open doors, etc. that allow too much outside hot or cold air into a zone. The control system 710, 810, 910 can provide graphs or charts showing which zones are used the most, which zones are used the least, when various zones are used, statistics for each zone, etc.

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The control system 810 can also use the diagnostic information to provide the user with data on how to reduce costs. During periods of cold weather the control system 810 can remind the user to reduce the temperature in relatively unused zones. The control system 810 can also remind the user to close off unused or rarely used zones in order to conserve heat in other zones. During periods of hot weather the control system 810 can remind the user to increase the temperature in relatively unused zones. The control system 810 can also remind the user to close off unused or rarely used zones in order to conserve cooling in other zones. In one embodiment, the control system 810 calculates the cost savings of closing off or reducing the cooling provided to various zones.

During periods of warm weather, the temperature inside a building can exceed the ambient temperature. In one embodiment, the control system 810 provides cooling by providing chilled air (e.g., air from an air-conditioning unit) to cool relatively high priority areas, and outside air (e.g., air pulled from an exterior vent) to cool areas that are warmer than ambient temperature. During such operation, the control system 810 can instruct the user to try and close off areas cooled by ambient air in order to prevent mixing of air between ambient-cooled zones and air-conditioned zones.

In one embodiment, a touch-screen panel is provided to the control system to facilitate user interface. In one embodiment, the control system is configured to communicate with a computer system (e.g., a personal computer, etc.) and the user interface is provided through software on the personal computer.

In one embodiment, the control system outputs a video signal compatible with a television monitor (e.g., an HDMI signal, an NTSC signal, etc.) so the user can use a television as the interface screen. In one such embodiment, a remote control is provided to allow the user to provide data to the control system while viewing the television.

It will be evident to those skilled in the art that the invention is not limited to the details of the foregoing illustrated embodiments and that the present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof; furthermore, various omissions, substitutions and changes may be made without departing from the spirit of the inventions. For example, although specific embodiments are described in terms of the 900 MHz frequency band, one of ordinary skill in the art will recognize that frequency bands above and below 900 MHz can be used as well. The wireless system can be configured to operate on one or more frequency bands, such as, for example, the HF band, the VHF band, the UHF band, the Microwave band, the Millimeter wave band, etc. One of ordinary skill in the art will further recognize that techniques other than spread spectrum can also be used and/or can be used instead spread spectrum. The modulation uses is not limited to any particular modulation method, such that modulation scheme used can be, for example, frequency modulation, phase modulation, amplitude modulation, combinations thereof, etc. The one or more of the wireless communication systems described above can be replaced by wired communication. The one or more of the wireless communication systems described above can be replaced by powerline networking communication. The foregoing description of the embodiments is, therefore, to be considered in all respects as illustrative and not restrictive, with the scope of the invention being delineated by the appended claims and their equivalents.

What is claimed is:

1. A system for zoned temperature control comprising:
 - a first zone thermostat to measure a temperature of a first zone;

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a second zone thermostat to measure a temperature of a second zone;

a first electronically-controlled register vent configured to vent air from a duct into said first zone;

a second electronically-controlled register vent configured to vent air from said duct into said second zone; and

a central system, said central system configured to obtain a first setpoint temperature and a first current zone temperature from said first zone thermostat, to obtain a second setpoint temperature and a second current zone temperature from said second zone thermostat, and to compute a first vent opening amount for said first electronically-controlled register vent and a second vent opening amount for said second electronically-controlled register vent according to said first and second current zone temperatures, said first and second setpoint temperatures, and a priority of said first zone relative to said second zone, said central system further configured to control operation of an HVAC system according to an allowed budget,

wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during heating periods, the temperature of relatively lower priority zones is allowed to fall below a desired setpoint relatively more than the temperature of relatively higher priority zones.

2. The system of claim 1, said first electronically-controlled register vent comprising an airflow sensor.

3. The system of claim 1, said first electronically-controlled register vent comprising a differential pressure sensor.

4. The system of claim 1, said first electronically-controlled register vent comprising an air velocity sensor.

5. The system of claim 1, said first electronically-controlled register vent comprising an auxiliary power source.

6. The system of claim 1, said first electronically-controlled register vent comprising a humidity sensor.

7. The system of claim 1, said first electronically-controlled register vent comprising a fan.

8. The system of claim 1, wherein said first electronically-controlled register vent is configured to transmit sensor data to said central system according to a threshold test.

9. The system of claim 8, wherein said threshold test comprises a high threshold level.

10. The system of claim 8, wherein said threshold test comprises a low threshold level.

11. The system of claim 8, wherein said threshold test comprises an inner threshold range.

12. The system of claim 8, wherein said threshold test comprises an outer threshold range.

13. The system of claim 1, wherein said first electronically-controlled register vent is configured to receive an instruction from said central system to change a data reporting interval.

14. The system of claim 1, wherein said first electronically-controlled register vent is configured to receive an instruction from said central system to change a sensor data reporting interval.

15. The system of claim 1, wherein said first zone thermostat is configured to report a temperature slope to said central system.

16. The system of claim 1, wherein said first electronically-controlled register vent includes a mechanical actuator configured to change an opening of a curtain.

17. The system of claim 16, wherein said actuator is provided to change an angle of one or more vents.

18. The system of claim 16, wherein said actuator is provided to change an opening of a curtain.

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19. The system of claim 16, wherein said actuator is configured to change direction of one or more diverters.

20. The system of claim 1, wherein said central system communicates with said first and second zone thermostats using wireless communication.

21. The system of claim 1, wherein said central system communicates with said first and second zone thermostats and said first and second electronically-controlled register vent using wireless communication.

22. The system of claim 21, wherein said wireless communication comprises radio-frequency communication.

23. The system of claim 21, wherein said wireless communication comprises frequency hopping.

24. The system of claim 21, wherein said wireless communication comprises a 900 megahertz band.

25. The system of claim 1, wherein said first electronically-controlled register vent comprises a visual indicator to indicate a low-power condition.

26. The system of claim 1, wherein said central system uses a predictive model to compute said first vent opening amount and said second vent opening amount.

27. The system of claim 26, wherein said predictive model is configured to reduce power consumption by said first electronically-controlled register vent and said second electronically-controlled register vent.

28. The system of claim 26, wherein said predictive model is configured to reduce movement of a first actuator in said first electronically-controlled register vent.

29. The system of claim 26, wherein said predictive model comprises a neural network.

30. The system of claim 1, wherein said first electronically-controlled register vent includes a fan and wherein said first electronically-controlled register vent is responsive to instructions from said central controller to provide power to said fan.

31. The system of claim 1, wherein said first electronically-controlled register vent includes a fan and wherein said first electronically-controlled register vent is configured to use said fan as a generator.

32. The system of claim 1, wherein said first zone thermostat is configured to report data to said central system in response to one or more instructions from said central system.

33. The system of claim 1, wherein said first zone thermostat is configured to report data to said central system at regular intervals.

34. The system of claim 1, wherein said central system is configured to budget use of said HVAC system according to anticipated weather conditions.

35. The system of claim 1, wherein said central system is configured to budget use of said HVAC system according to anticipated energy costs.

36. The system of claim 1, wherein said central system is configured to ration use of said HVAC system according to said budget.

37. The system of claim 1, wherein said central system is configured to ration use of said HVAC system by lowering a temperature in zones of relatively lower priority.

38. The system of claim 1, wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during cooling periods, the temperature of relatively lower priority zones is allowed to rise higher above a desired setpoint relatively more than the temperature of relatively higher priority zones.

39. The system of claim 1, wherein said central system is configured to receive weather forecasts and to ration heating according to said forecast.

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40. The system of claim 1, wherein said central system is configured to receive weather forecasts and to ration cooling according to said forecast.

41. A system for zoned temperature control comprising:
a first zone thermostat to measure a temperature of a first zone;
a second zone thermostat to measure a temperature of a second zone;
a first electronically-controlled register vent configured to vent air from a duct into said first zone;
a second electronically-controlled register vent configured to vent air from said duct into said second zone; and
a control system, said control system configured to obtain a first setpoint temperature and a first current zone temperature from said first zone thermostat, to obtain a second setpoint temperature and a second current zone temperature from said second zone thermostat, and to compute a first vent opening amount for said first electronically-controlled register vent and a second vent opening amount for said second electronically-controlled register vent computed at least in part based on said first and second current zone temperatures, said first and second setpoint temperatures, and a priority of said first zone relative to said second zone;

wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during heating periods, the temperature of relatively lower priority zones is allowed to fall below a desired setpoint relatively more than the temperature of relatively higher priority zones.

42. The system of claim 41, said first electronically-controlled register vent comprising an airflow sensor.

43. The system of claim 41, said first electronically-controlled register vent comprising an auxiliary power source.

44. The system of claim 41, said first electronically-controlled register vent comprising a fan.

45. The system of claim 41, wherein said first electronically-controlled register vent is configured to transmit sensor data to said control system according to a threshold test.

46. The system of claim 41, wherein said first zone thermostat is configured to report a rate of temperature change to said control system.

47. The system of claim 41, wherein said central system communicates with said first and second zone thermostats using wireless communication.

48. The system of claim 41, wherein said central system uses a predictive model to compute said first vent opening amount and said second vent opening amount.

49. The system of claim 48, wherein said predictive model is configured to reduce power consumption by said first electronically-controlled register vent and said second electronically-controlled register vent.

50. The system of claim 48, wherein said predictive model is configured to reduce movement of a first actuator in said first electronically-controlled register vent.

51. The system of claim 41, wherein said central system is configured to budget use of said HVAC system according to anticipated weather conditions.

52. The system of claim 41, wherein said central system is configured to budget use of said HVAC system according to anticipated energy costs.

53. The system of claim 41, wherein said central system is configured to ration use of said HVAC system according to said budget.

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54. The system of claim 41, wherein said central system is configured to ration use of said HVAC system by lowering a temperature in zones of relatively lower priority.

55. The system of claim 41, wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during cooling periods, the temperature of relatively lower priority zones is allowed to rise higher above a desired setpoint relatively more than the temperature of relatively higher priority zones.

56. The system of claim 41, wherein said central system is configured to receive weather forecasts and to ration heating according to said forecast.

57. The system of claim 41, wherein said central system is configured to receive weather forecasts and to ration cooling according to said forecast.

58. A system for zoned temperature control comprising:
a first zone thermostat to measure a temperature of a first zone;

a second zone thermostat to measure a temperature of a second zone;

a first electronically-controlled register vent configured to vent air from a duct into said first zone;

a second electronically-controlled register vent configured to vent air from said duct into said second zone; and

a control system, said central system configured to obtain a first setpoint temperature and a first current zone temperature from said first zone thermostat, to obtain a second setpoint temperature and a second current zone temperature from said second zone thermostat, and to compute a first vent opening amount for said first electronically-controlled register vent and a second vent opening amount for said second electronically-controlled register vent according to said first and second current zone temperatures, said first and second setpoint temperatures, and a priority of said first zone relative to said second zone, said central system further configured to control operation of an HVAC system according to an allowed budget;

wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during cooling periods, the temperature of relatively

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lower priority zones is allowed to rise higher above a desired setpoint relatively more than the temperature of relatively higher priority zones.

59. The system of claim 58, wherein said central system uses a predictive model to compute said first vent opening amount and said second vent opening amount, wherein said predictive model is configured to reduce movement of a first actuator in said first electronically-controlled register vent.

60. A system for zoned temperature control comprising:

a first zone thermostat to measure a temperature of a first zone;

a second zone thermostat to measure a temperature of a second zone;

a first electronically-controlled register vent configured to vent air from a duct into said first zone;

a second electronically-controlled register vent configured to vent air from said duct into said second zone; and

a control system, said control system configured to obtain a first setpoint temperature and a first current zone temperature from said first zone thermostat, to obtain a second setpoint temperature and a second current zone temperature from said second zone thermostat, and to compute a first vent opening amount for said first electronically-controlled register vent and a second vent opening amount for said second electronically-controlled register vent computed at least in part based on said first and second current zone temperatures, said first and second setpoint temperatures, and a priority of said first zone relative to said second zone;

wherein said central system is configured to ration use of said HVAC system by maintaining different temperature ranges in zones according to a priority of each zone such that during cooling periods, the temperature of relatively lower priority zones is allowed to rise higher above a desired setpoint relatively more than the temperature of relatively higher priority zones.

61. The system of claim 60, wherein said central system uses a predictive model to compute said first vent opening amount and said second vent opening amount, wherein said predictive model is configured to reduce movement of a first actuator in said first electronically-controlled register vent.

* * * * *



US008239922B2

(12) **United States Patent**
Sullivan et al.

(10) **Patent No.:** **US 8,239,922 B2**
(45) **Date of Patent:** ***Aug. 7, 2012**

(54) **REMOTE HVAC CONTROL WITH USER PRIVILEGE SETUP**

(75) **Inventors:** **Daniel J. Sullivan**, St. Anthony, MN (US); **Geoffrey Ho**, Minneapolis, MN (US)

(73) **Assignee:** **Honeywell International Inc.**, Morristown, NJ (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1215 days.

This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**

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G06F 17/30 (2006.01)

G06F 15/16 (2006.01)

G06F 15/173 (2006.01)

G03D 23/00 (2006.01)

G03B 15/00 (2006.01)

(52) **U.S. Cl.** 726/4; 726/27; 236/51; 236/94; 700/83; 709/276; 709/203; 709/217; 709/225

(58) **Field of Classification Search** 726/4, 27, 236/51, 94; 700/83, 276; 709/203, 217, 709/225

See application file for complete search history.

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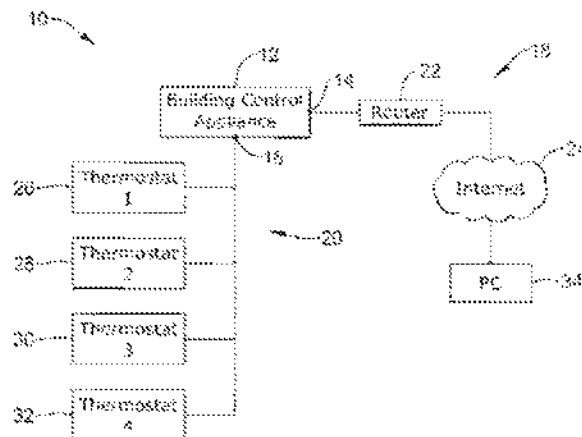
Primary Examiner — Anveind Moorthy

(74) *Attorney, Agent, or Firm* — Sanger Tullie & Wickham LLC

(57) **ABSTRACT**

An HVAC control system that accommodates and/or facilitates control from a remote location. The HVAC control system may include a web-enabled building control appliance with a controller, a first port and a second port. The controller may implement a web server that is coupled to the first port for serving up one or more web pages on a first network and for receiving a number of responses. The controller may be coupled to the second port so as to communicate with one or more communicating thermostats via a second network. The web server may provide one or more web-pages via the first port that solicit and receive user rights privileges.

28 Claims, 75 Drawing Sheets



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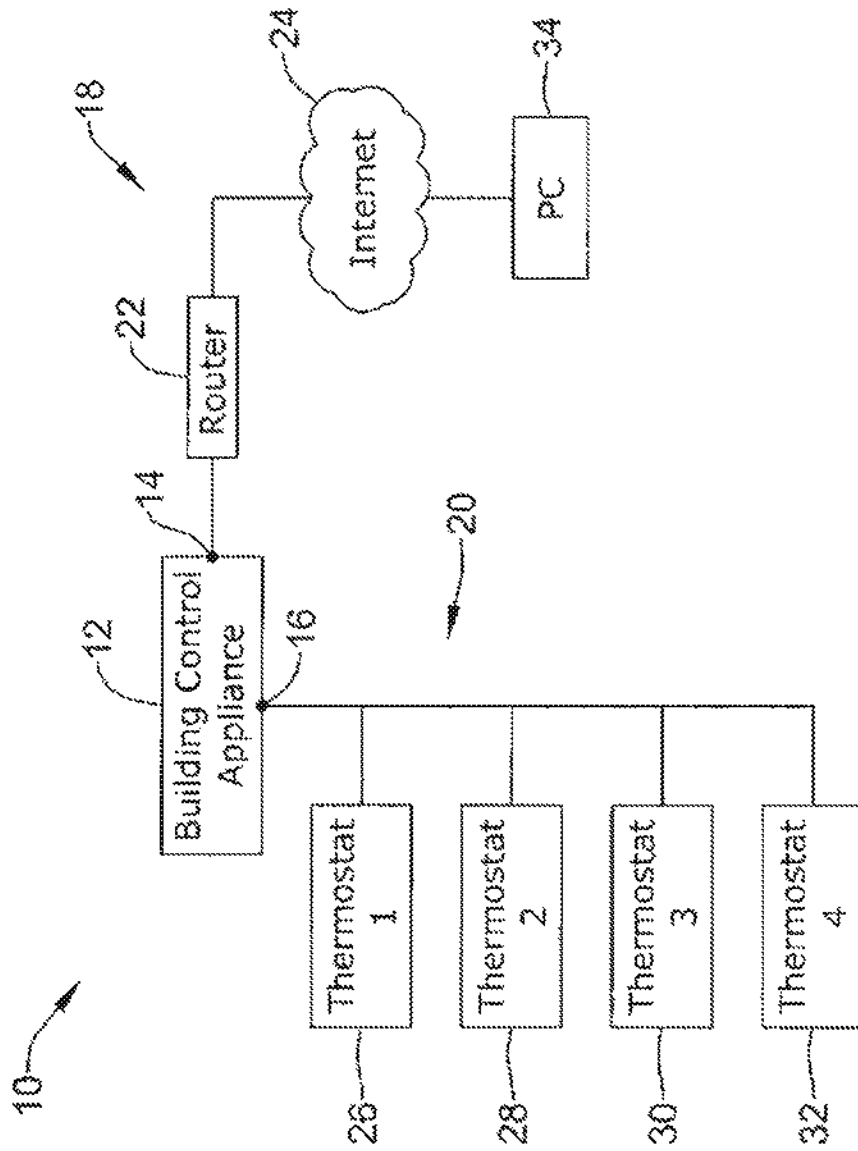


Figure 1

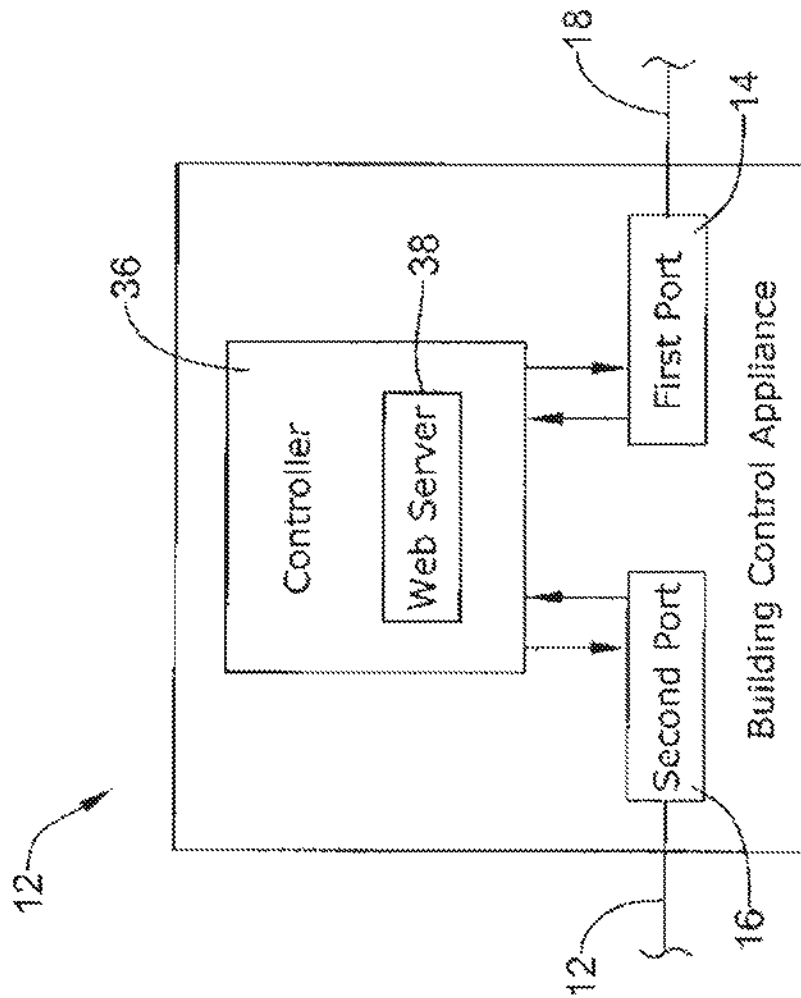


Figure 2

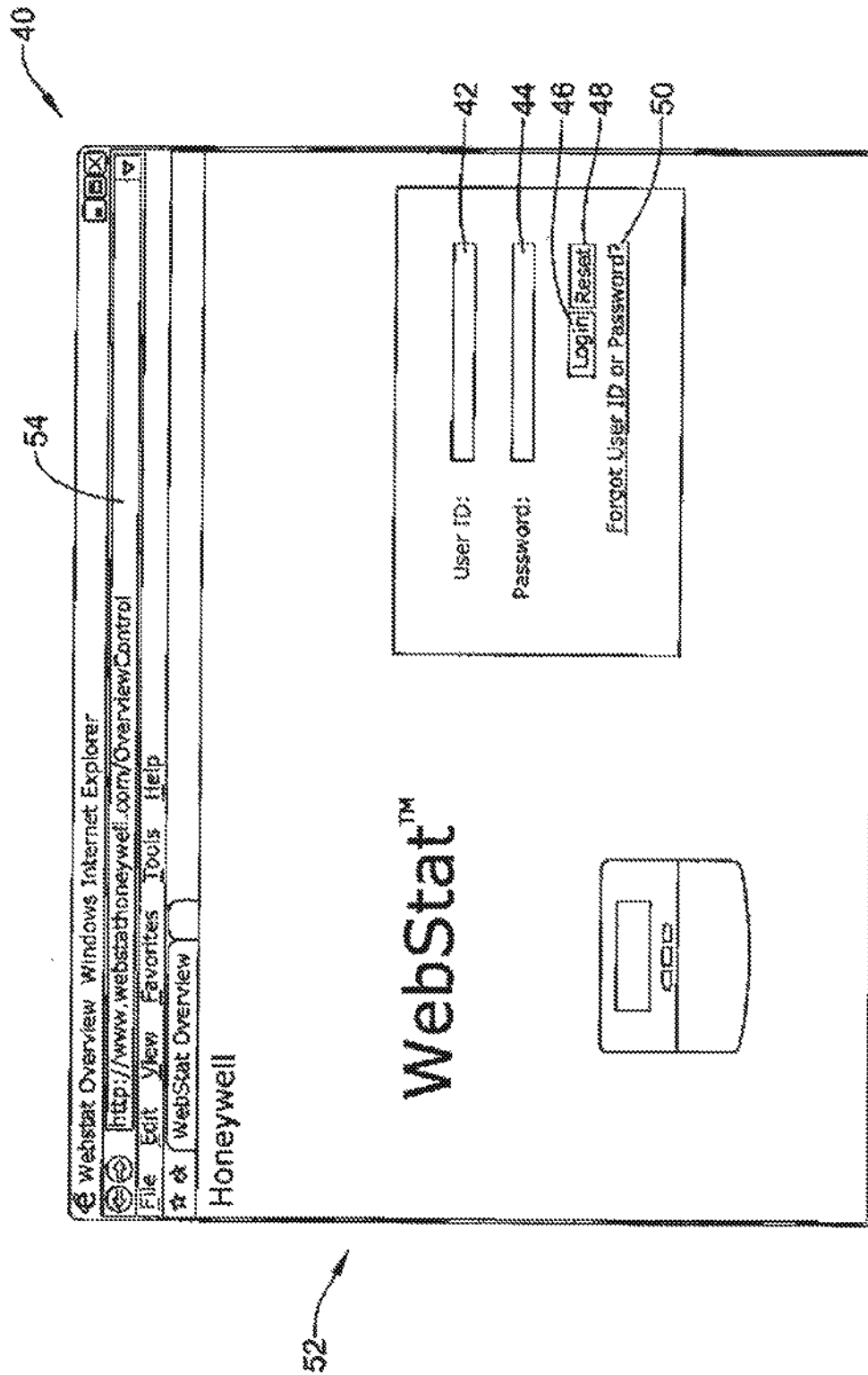


Figure 3A

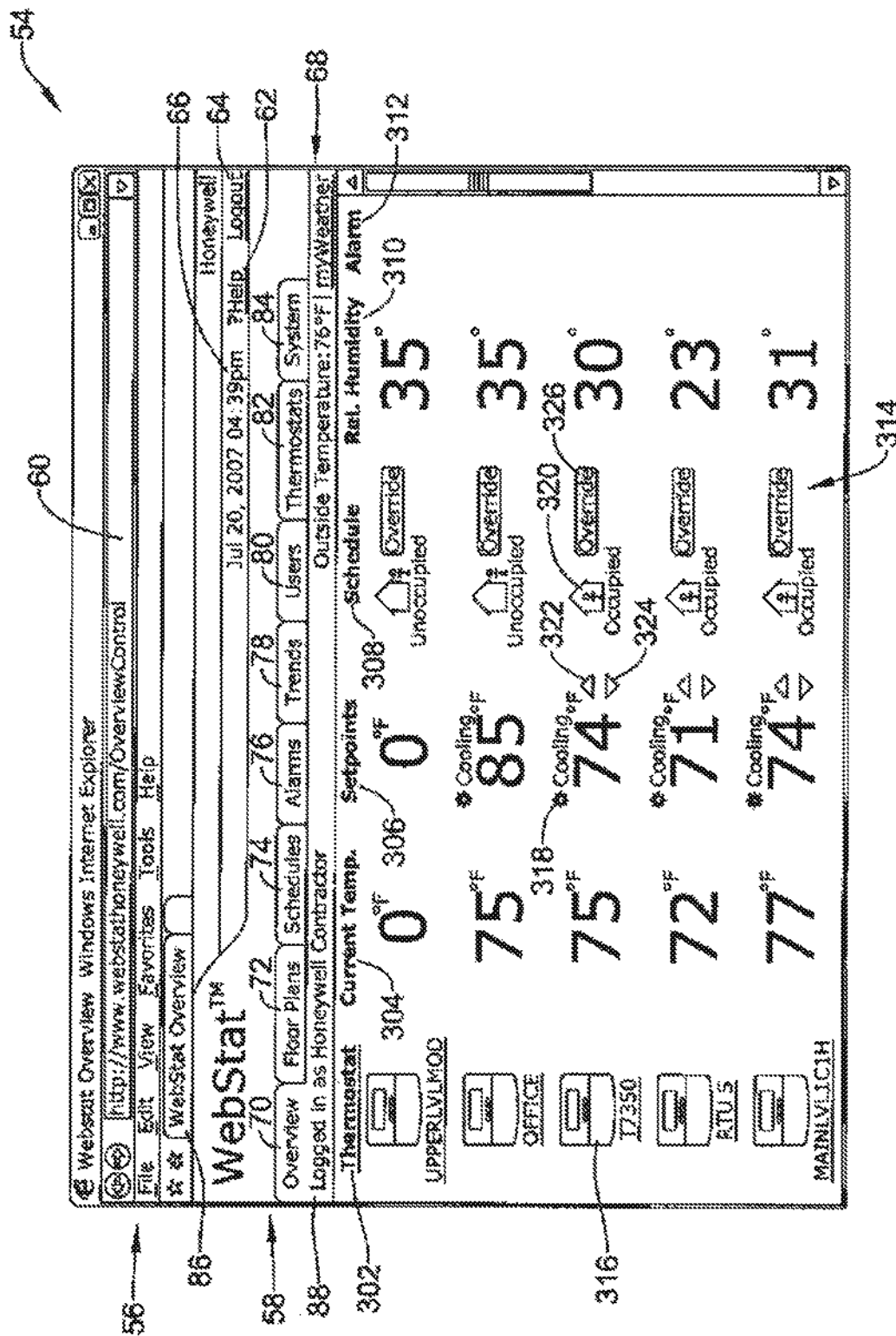


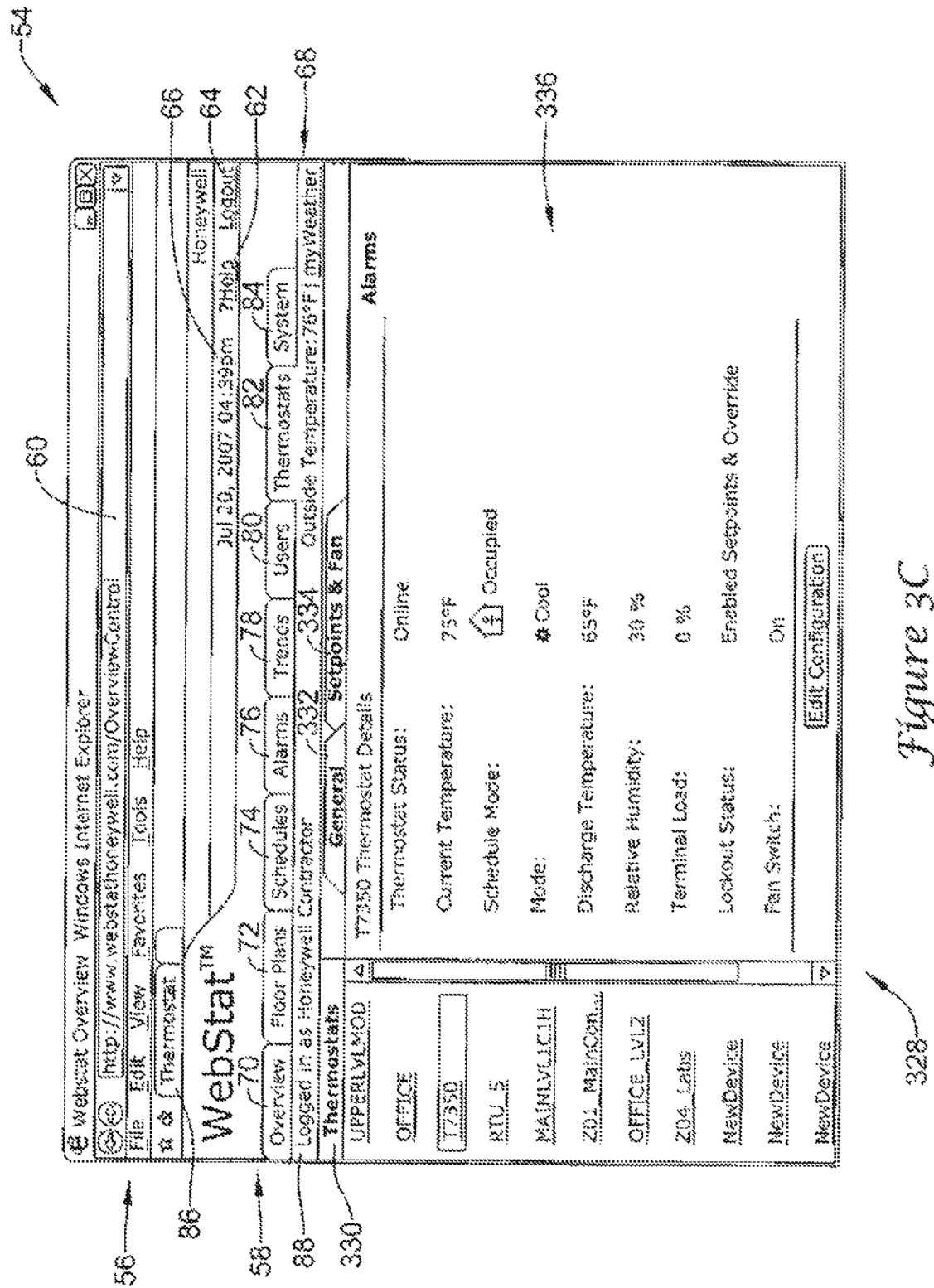
Figure 3B

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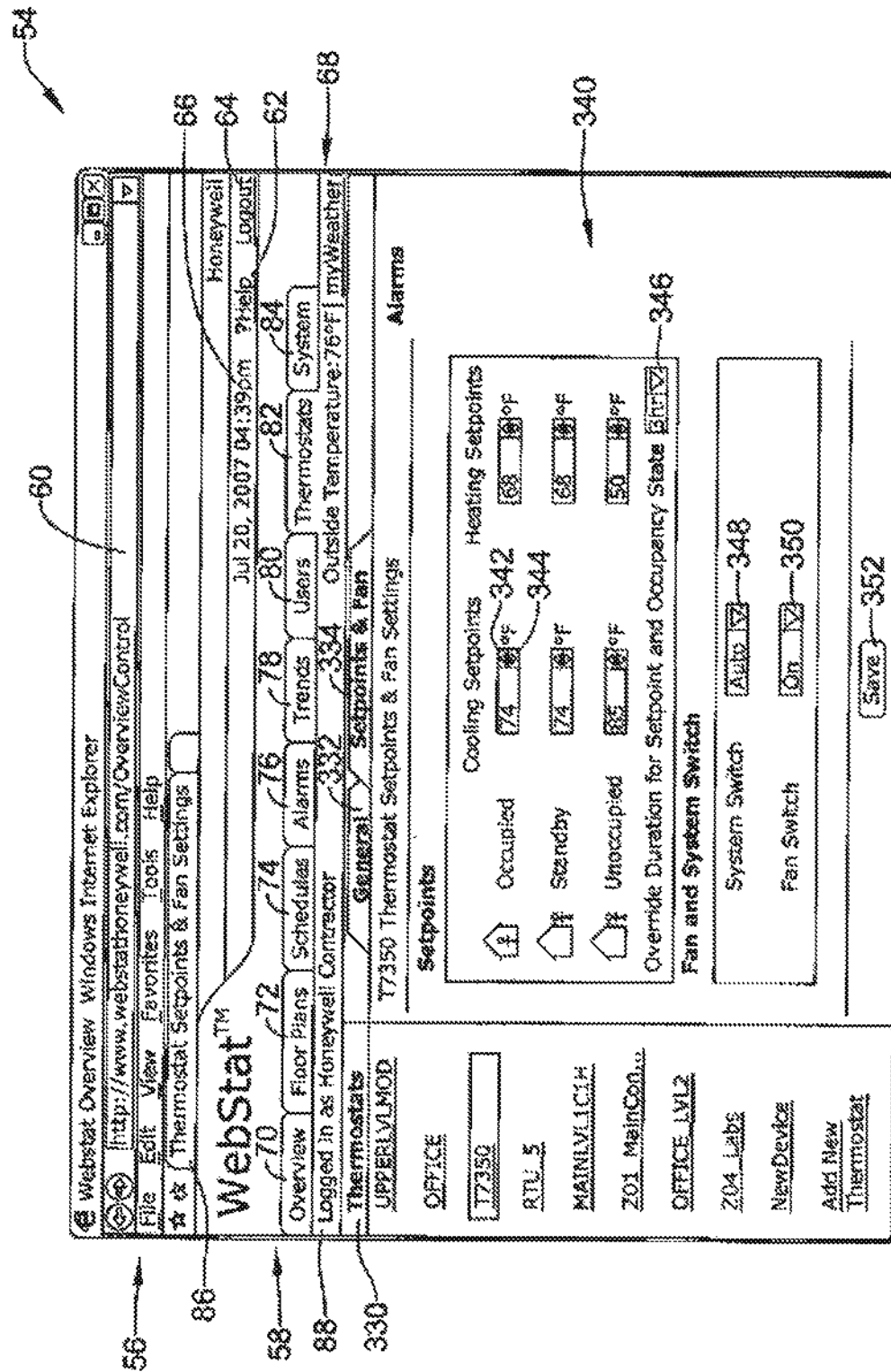


Figure 3D

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Override Scheduled Occupancy State - Windows Internet Explorer
http://www.webstationeywell.com/OverviewControl

Override Scheduled Occupancy State
Override to: Unoccupied (356)

Select duration for Temporary Override
(The Temporary Unoccupied state begins immediately after pressing OK and continues until the set duration time expires.)
Day(s): 14 (358) Hour(s): 0 (360)

Select thermostats to Temporary Unoccupied
☐ Select All Thermostats (362)

- ☐ UPPERLVLMOD
- ☐ OFFICE
- ☒ T7350
- ☐ RTU_5
- ☐ MAINLVLC1H
- ☐ Z01_MainConfere...
- ☐ OFFICE_LVL2 (364)

OK (366) Cancel (368)

Figure 3F

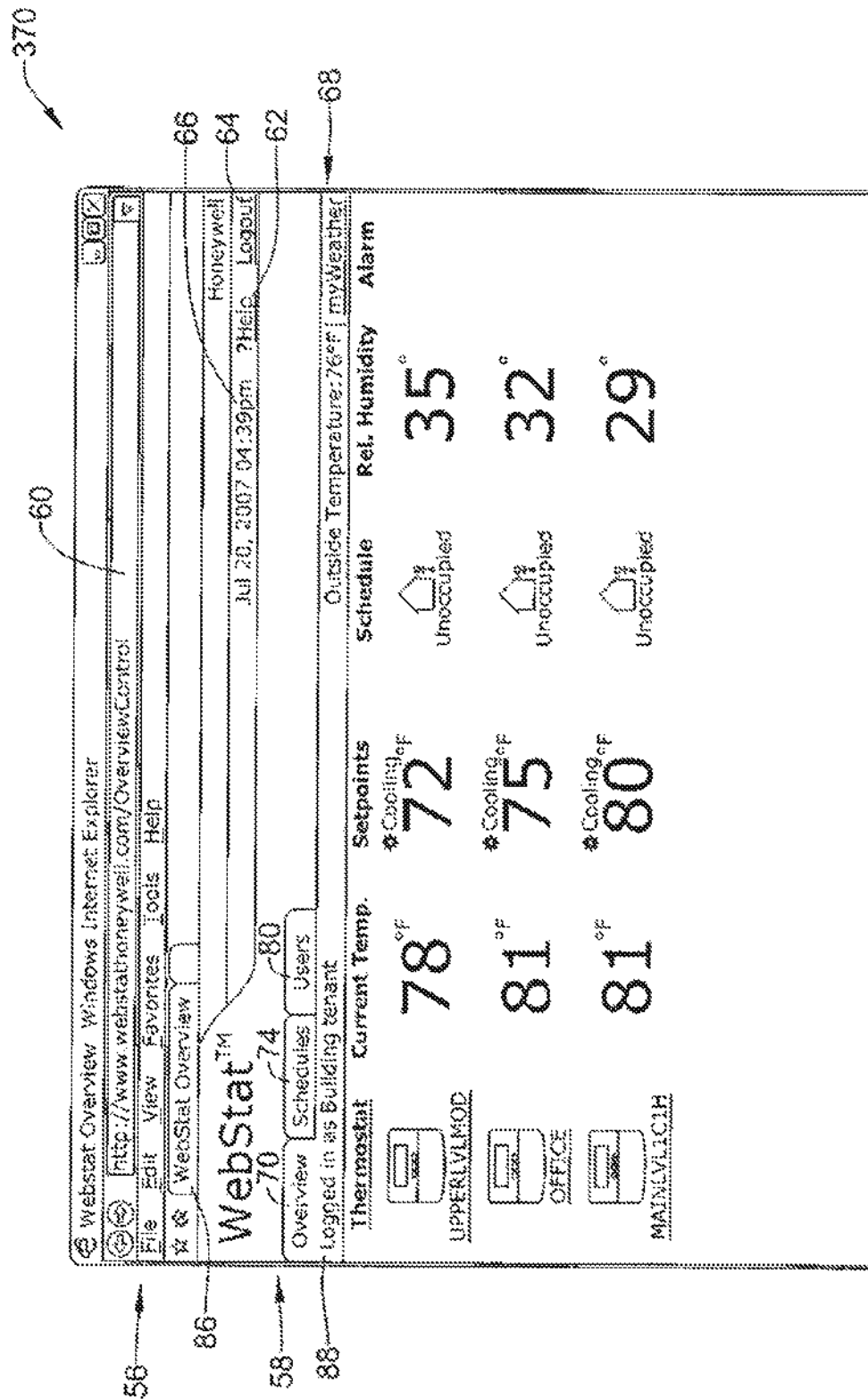


Figure 3F

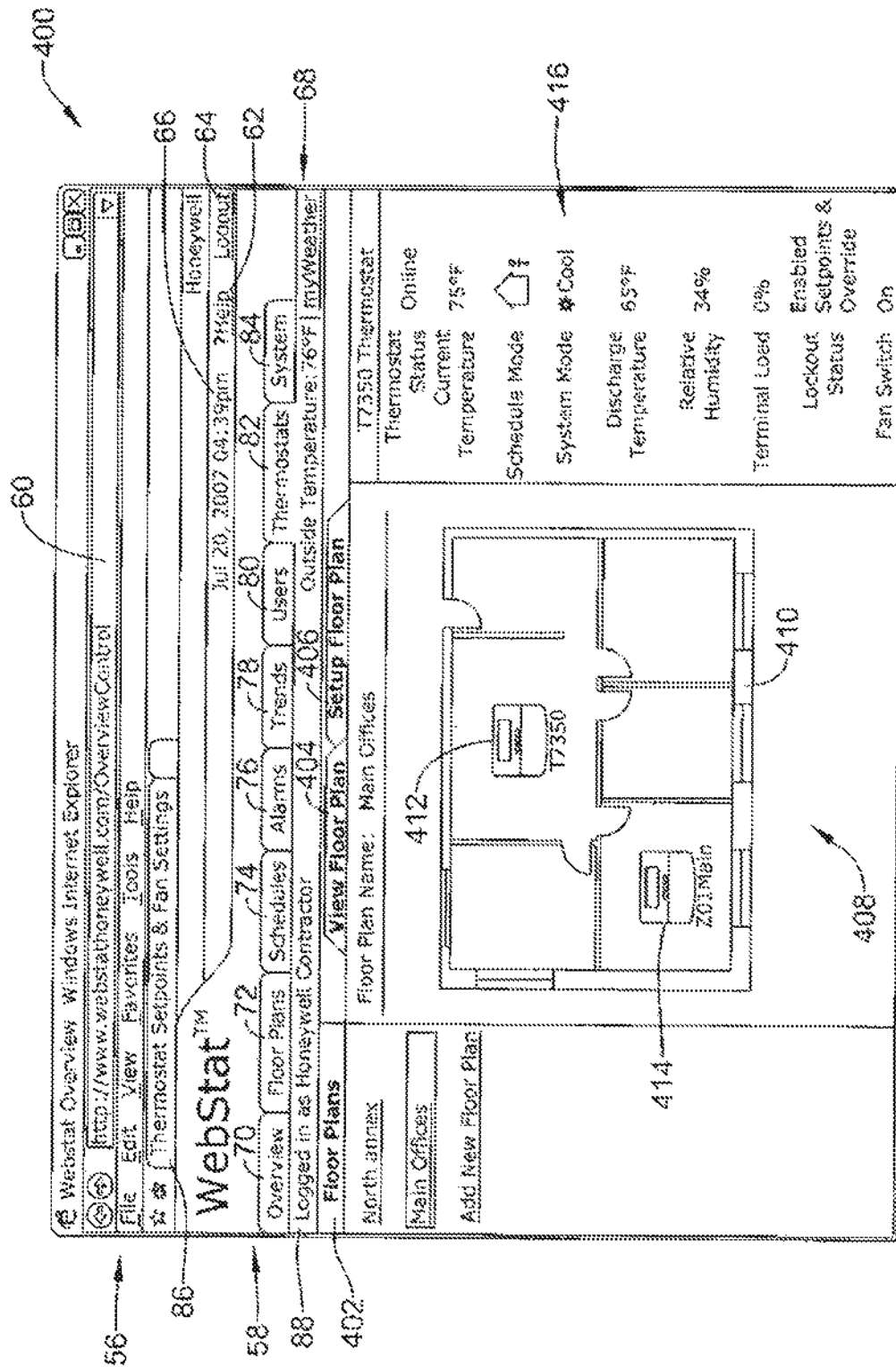


Figure 4A

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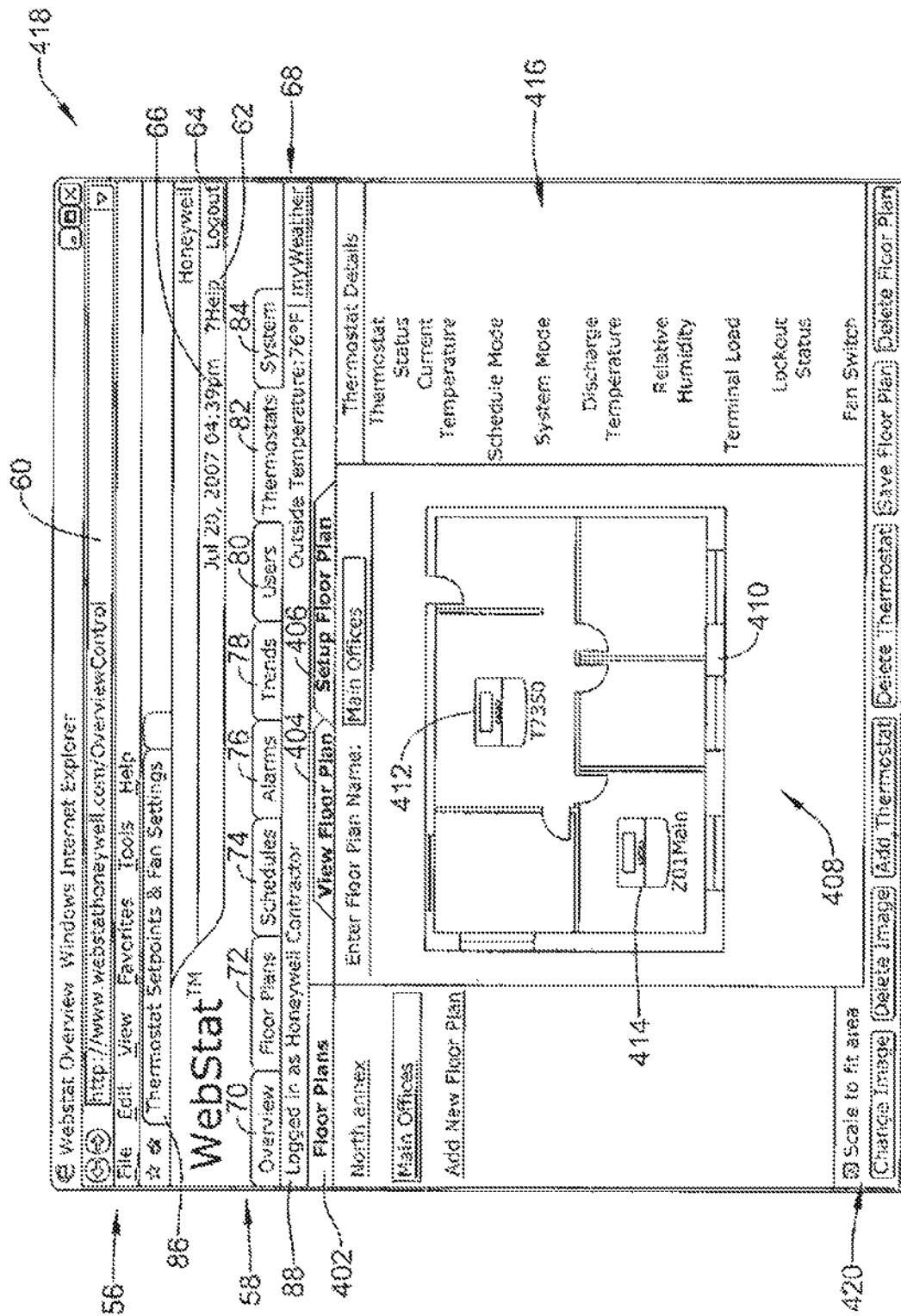


Figure 4B

424

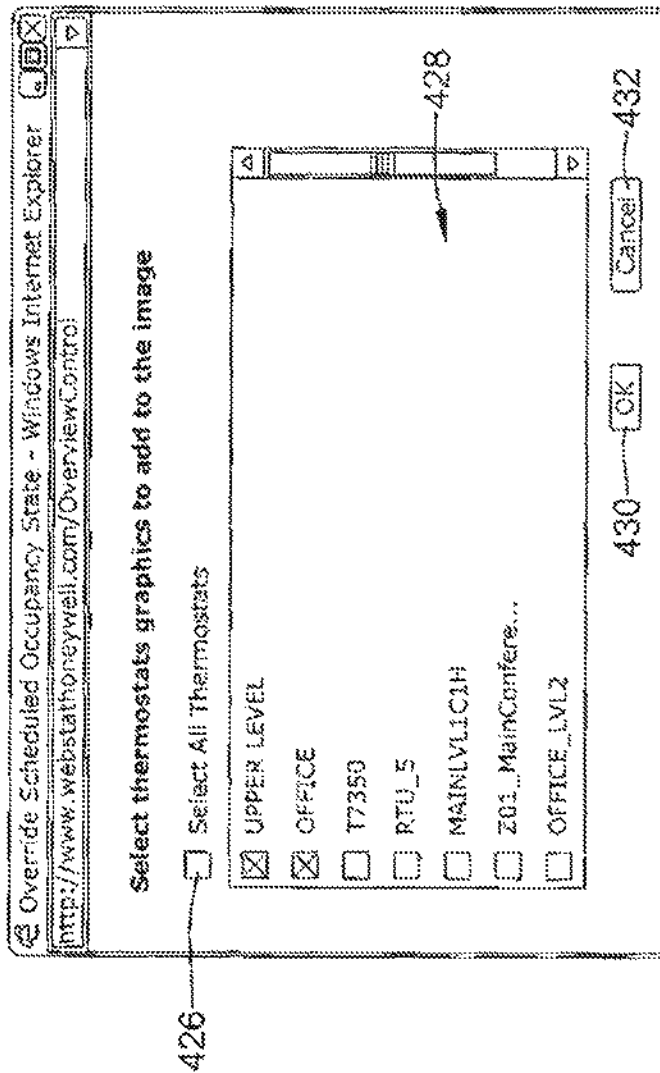


Figure 4C

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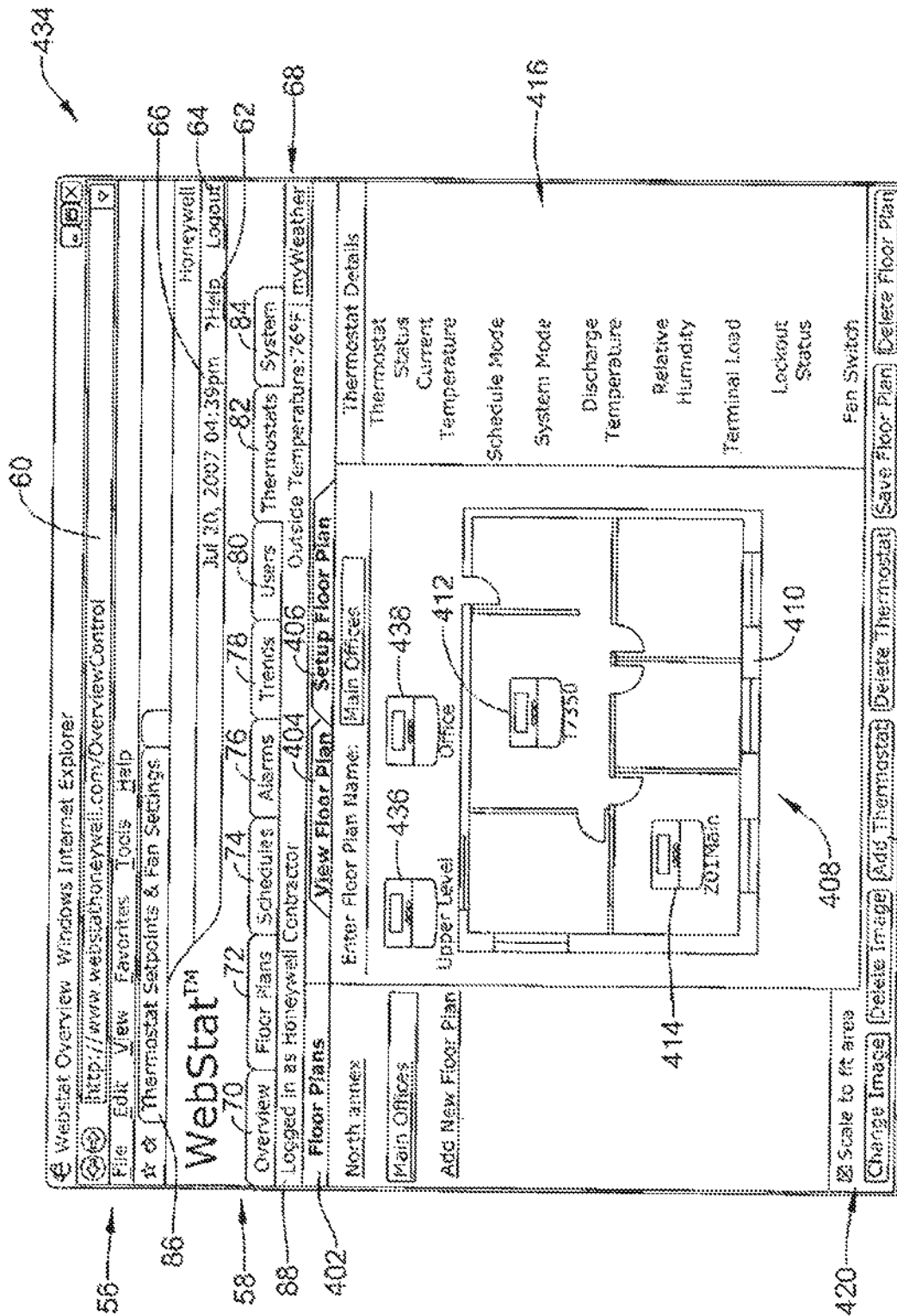


Figure 4D

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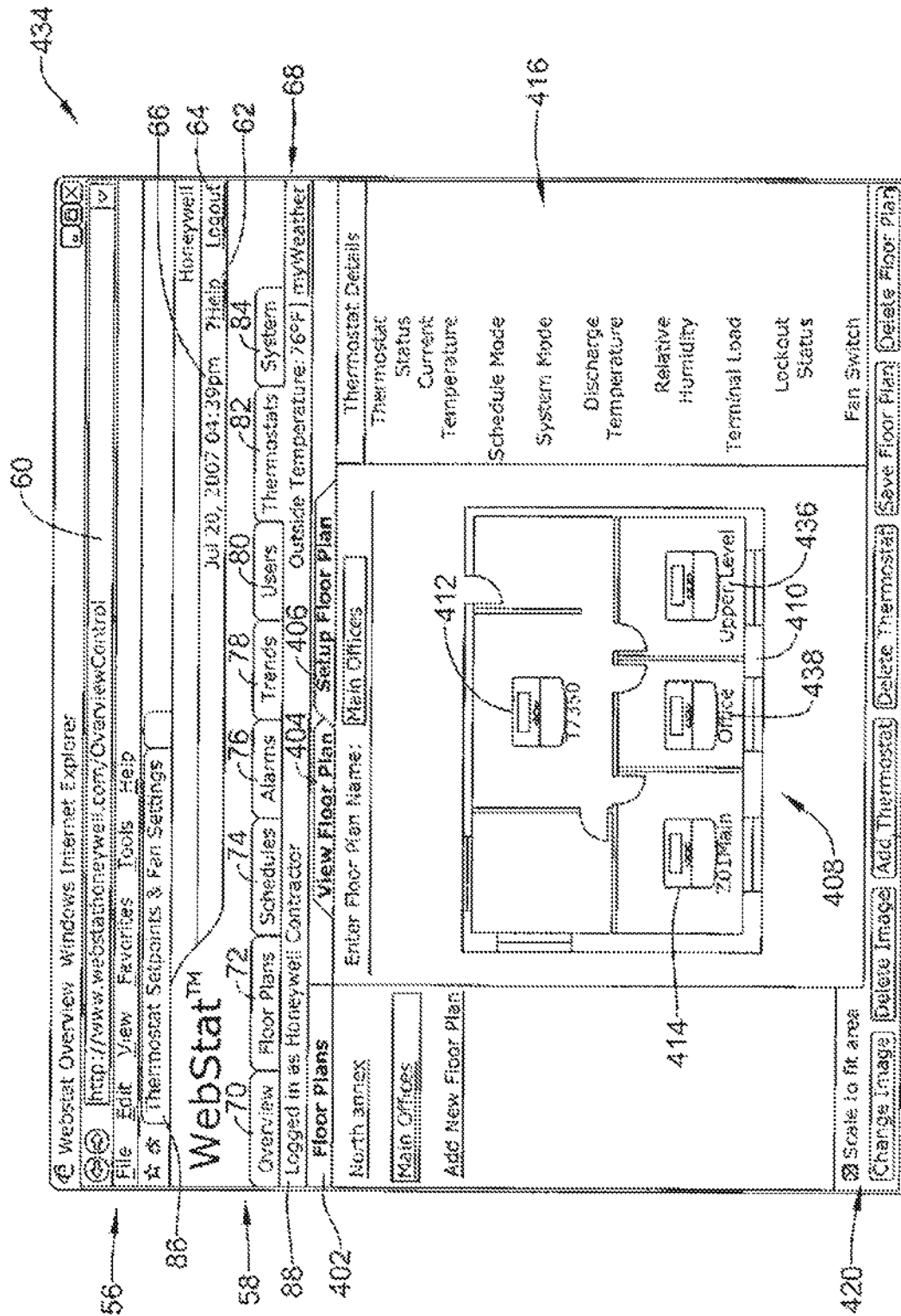


Figure 4E

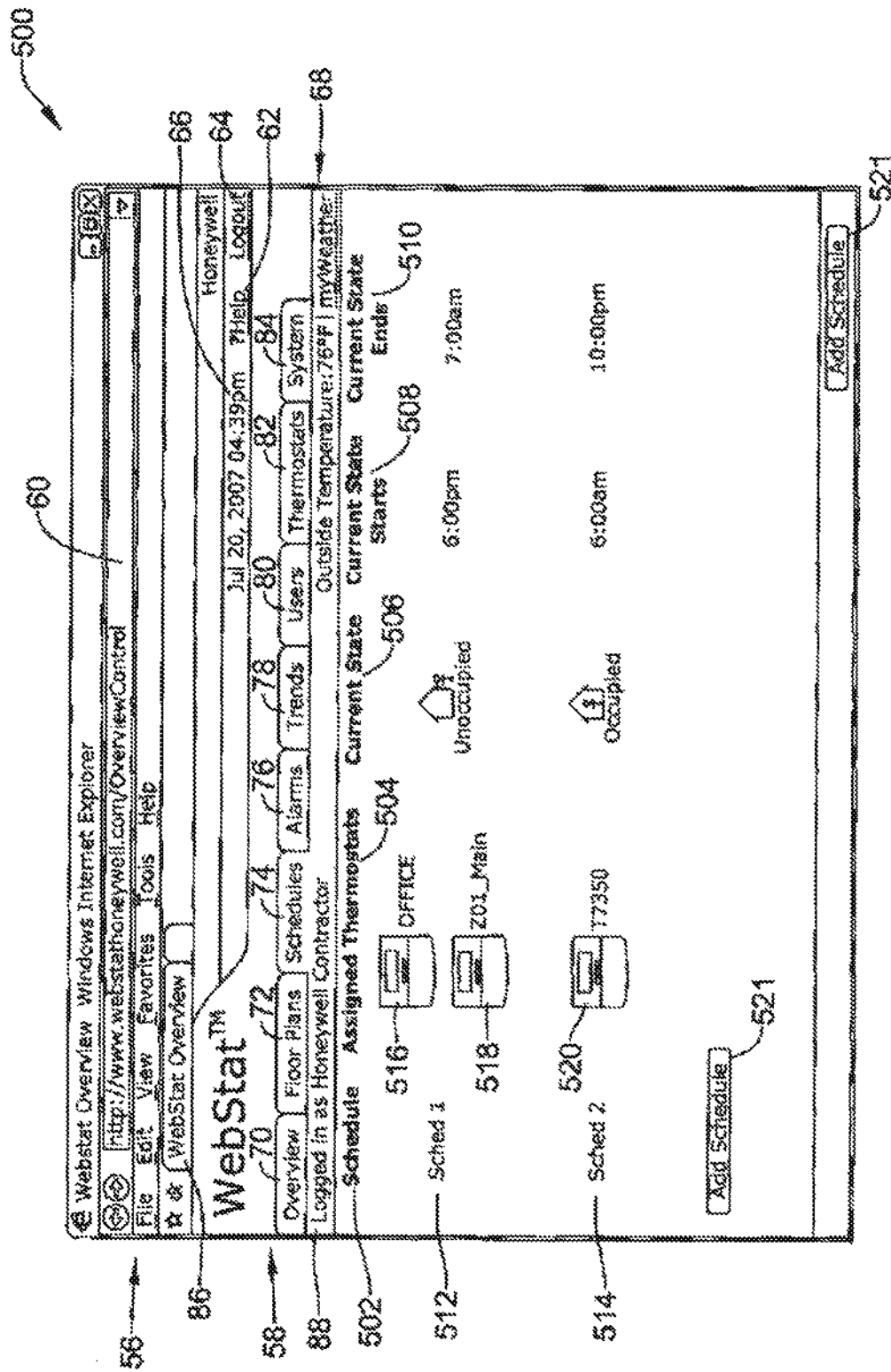


Figure 5A

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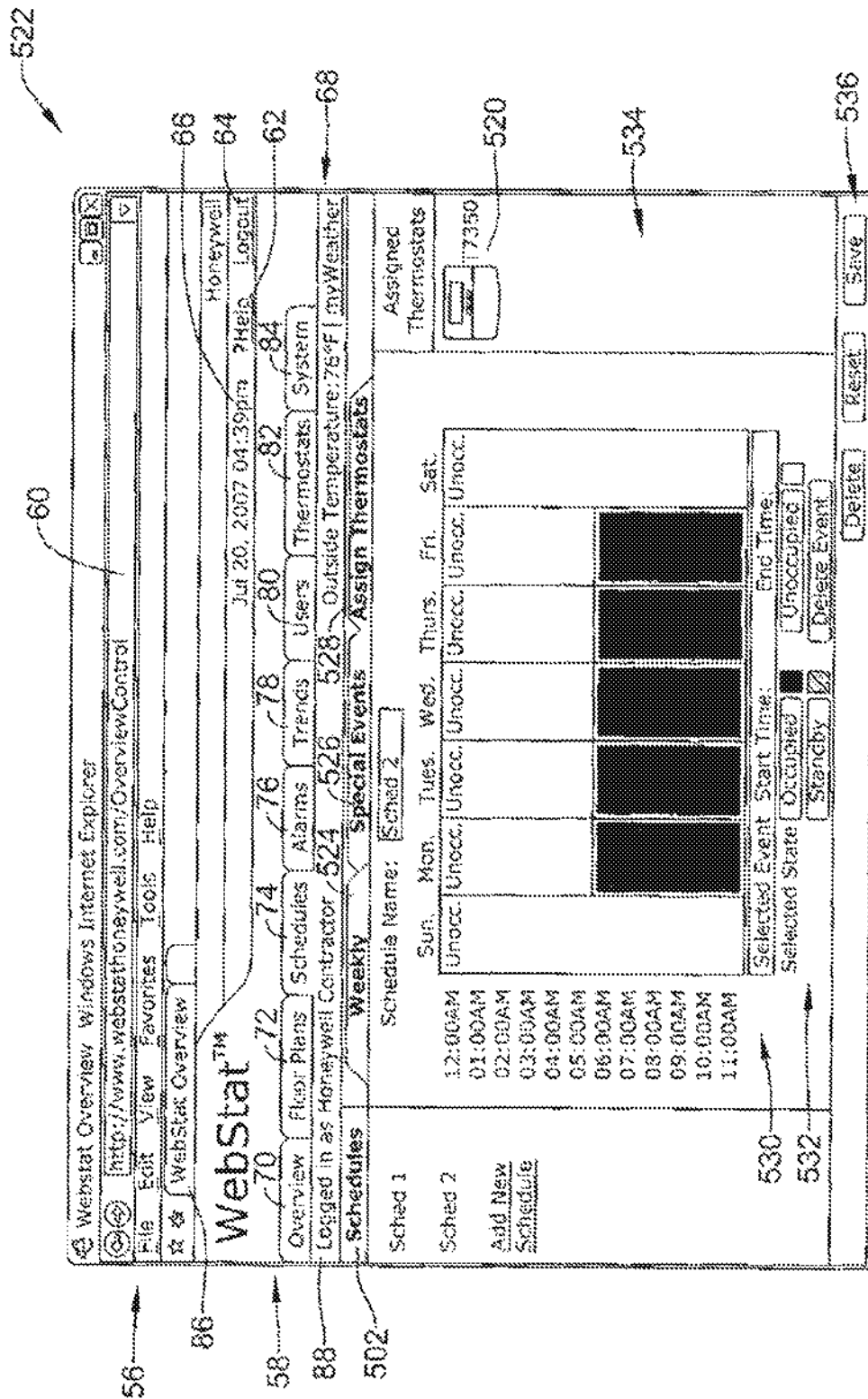


Figure 5B

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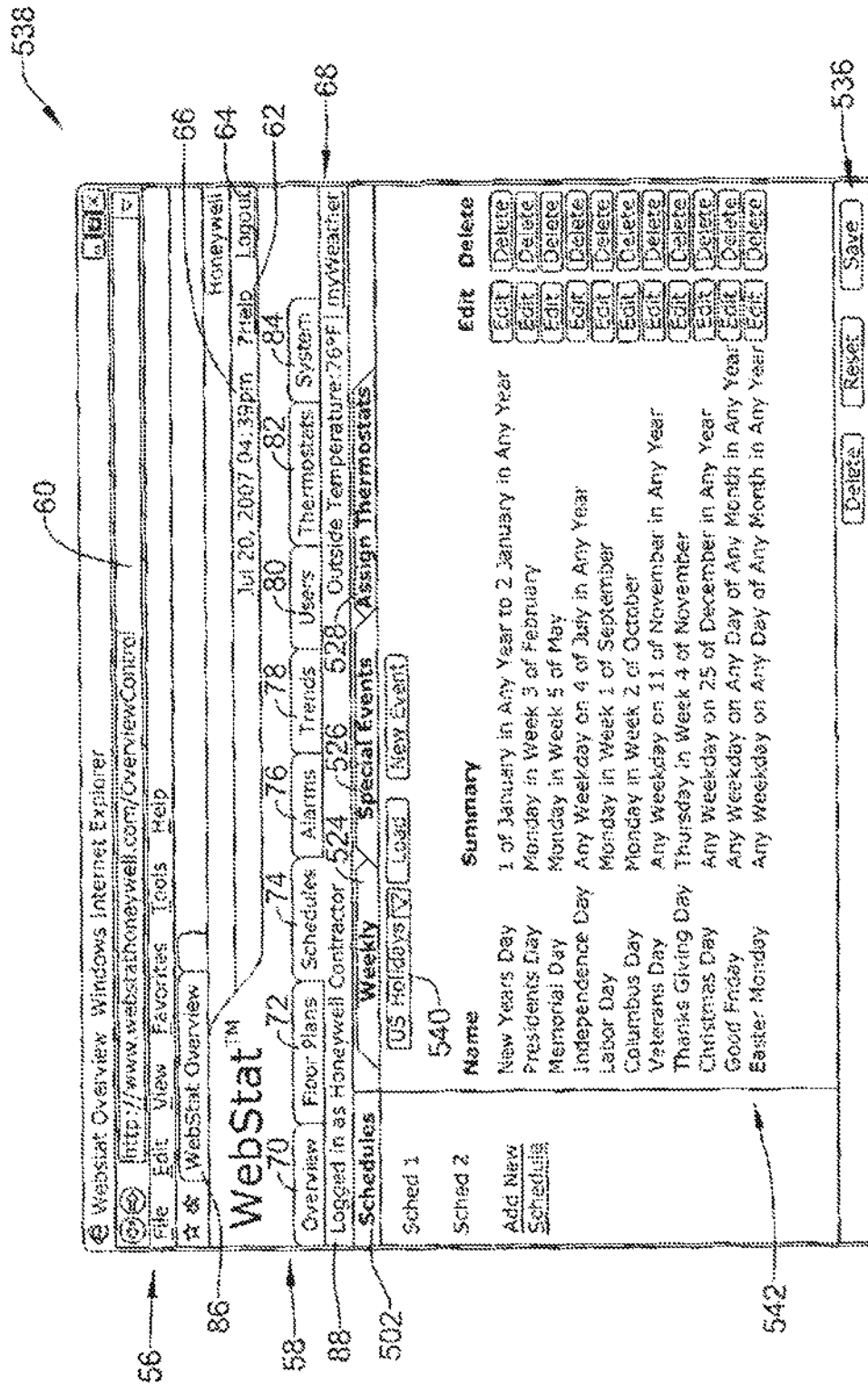


Figure 5C

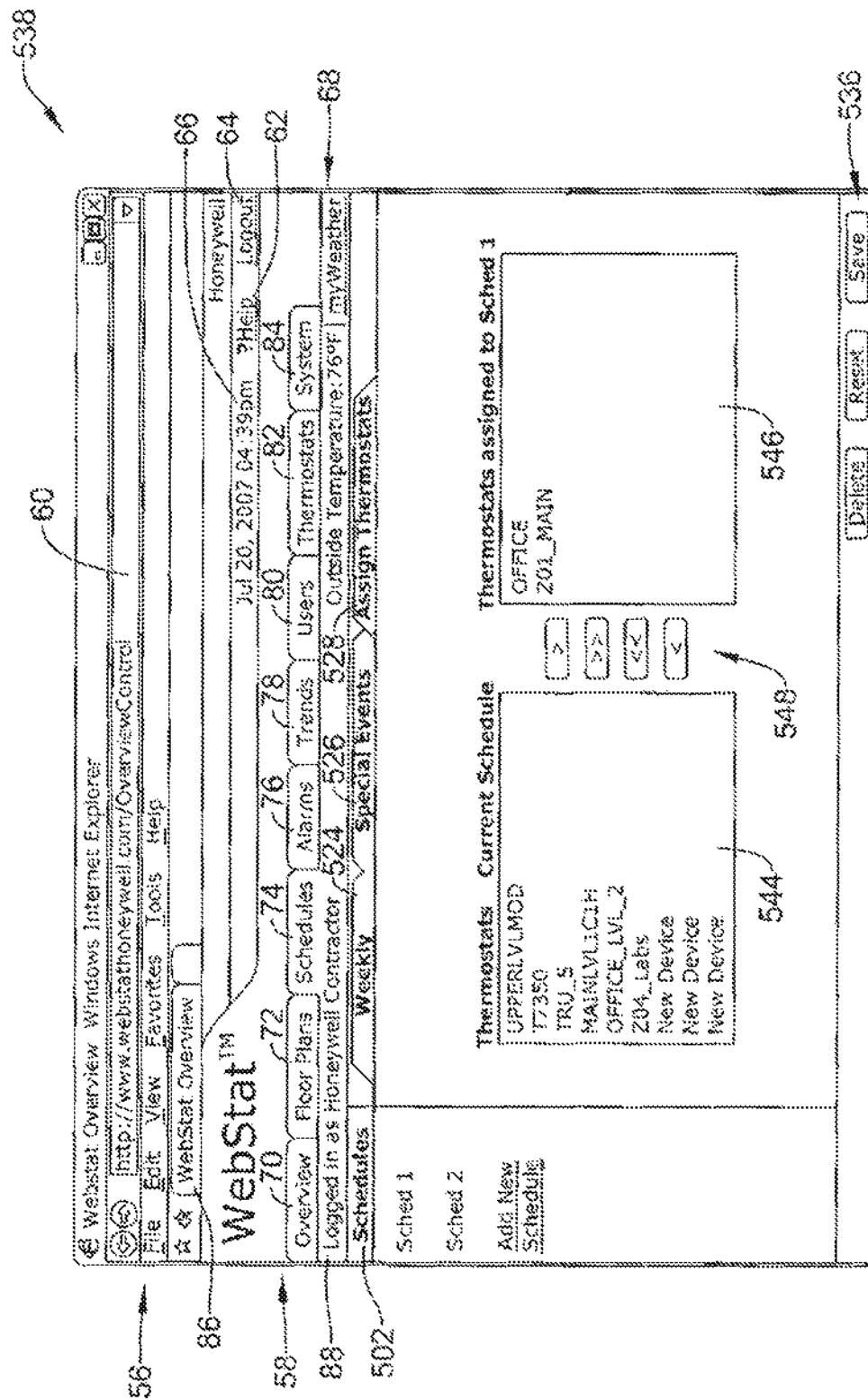


Figure 5D

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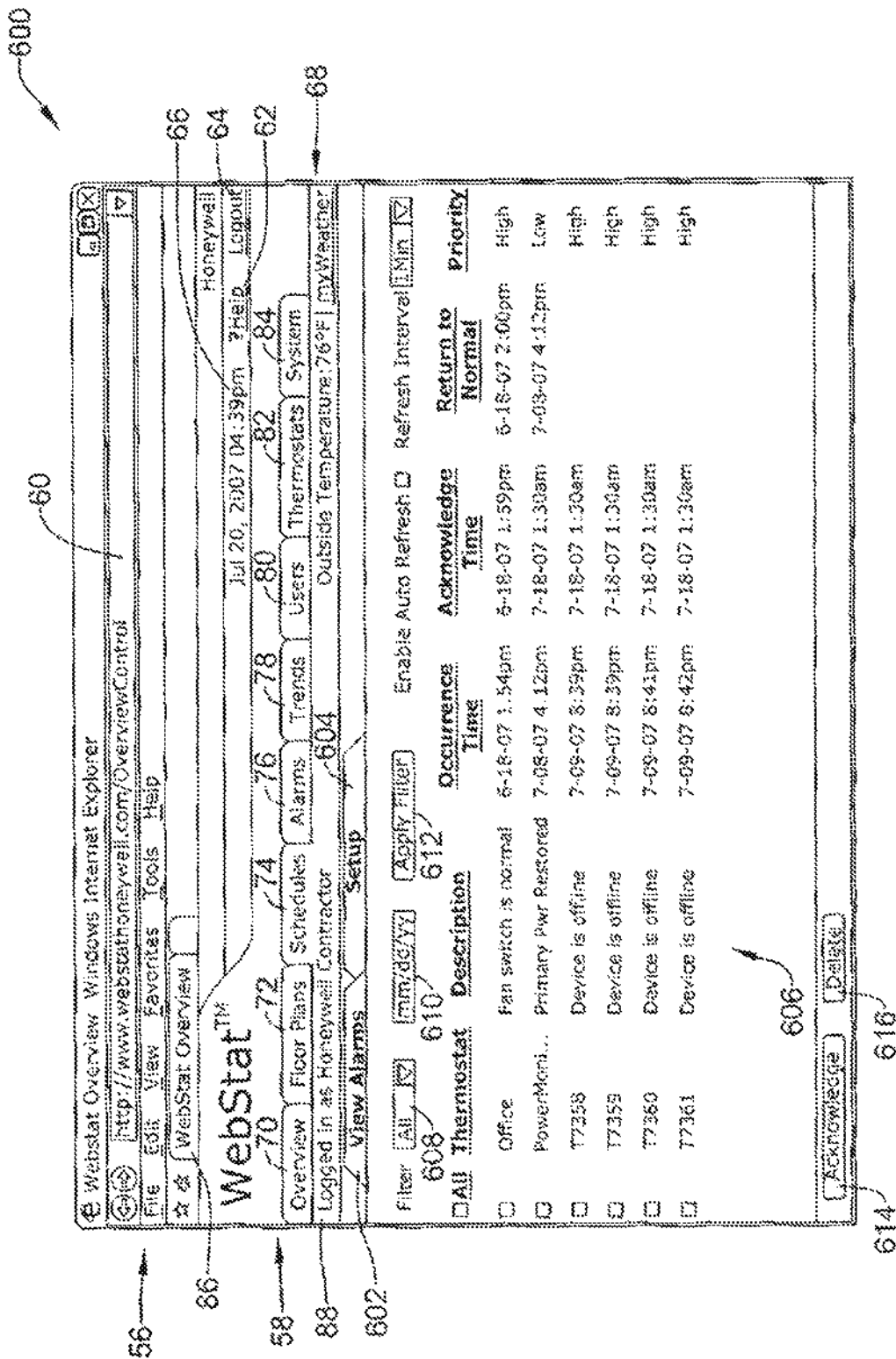


Figure 6A

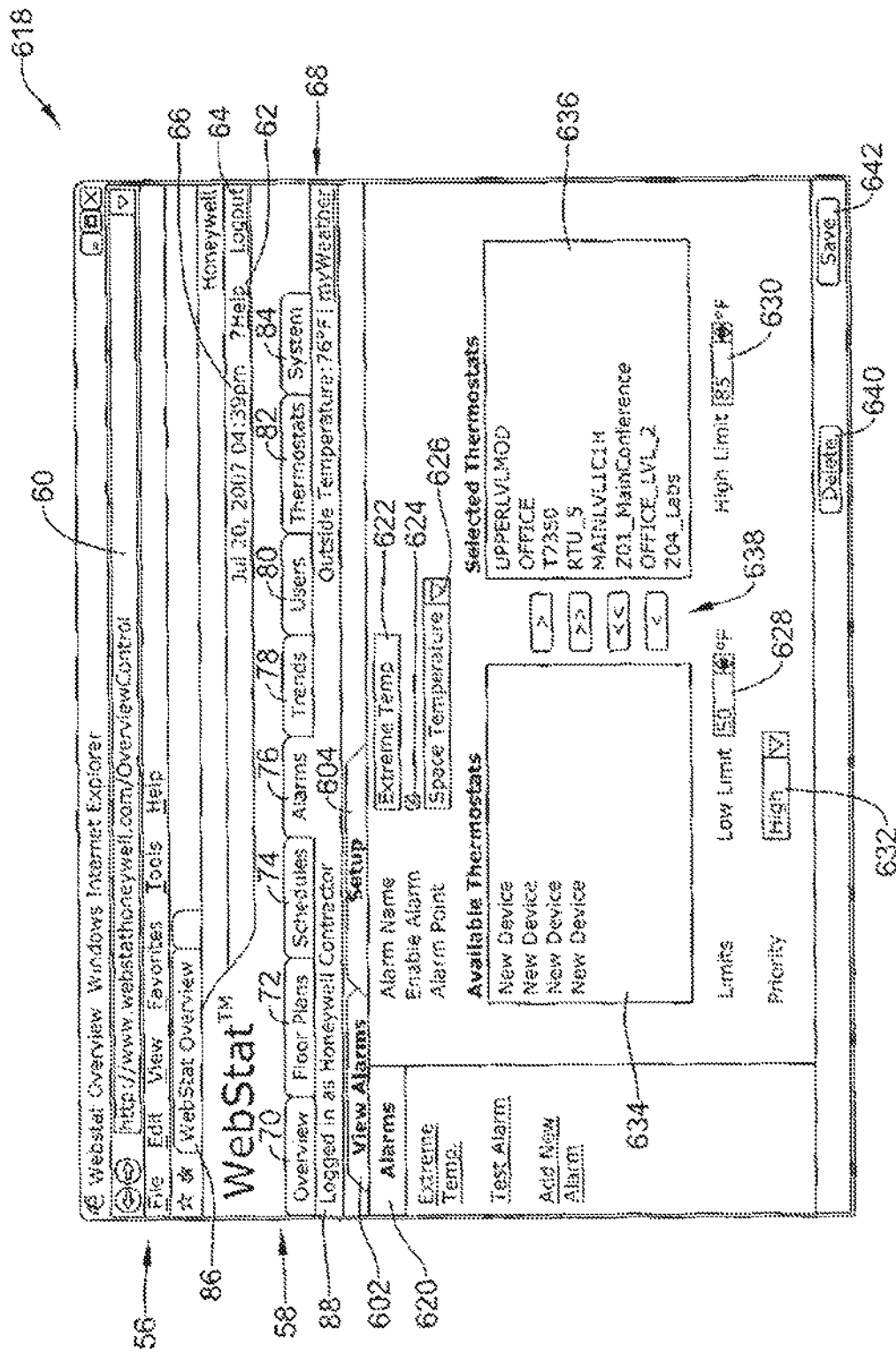


Figure 6B

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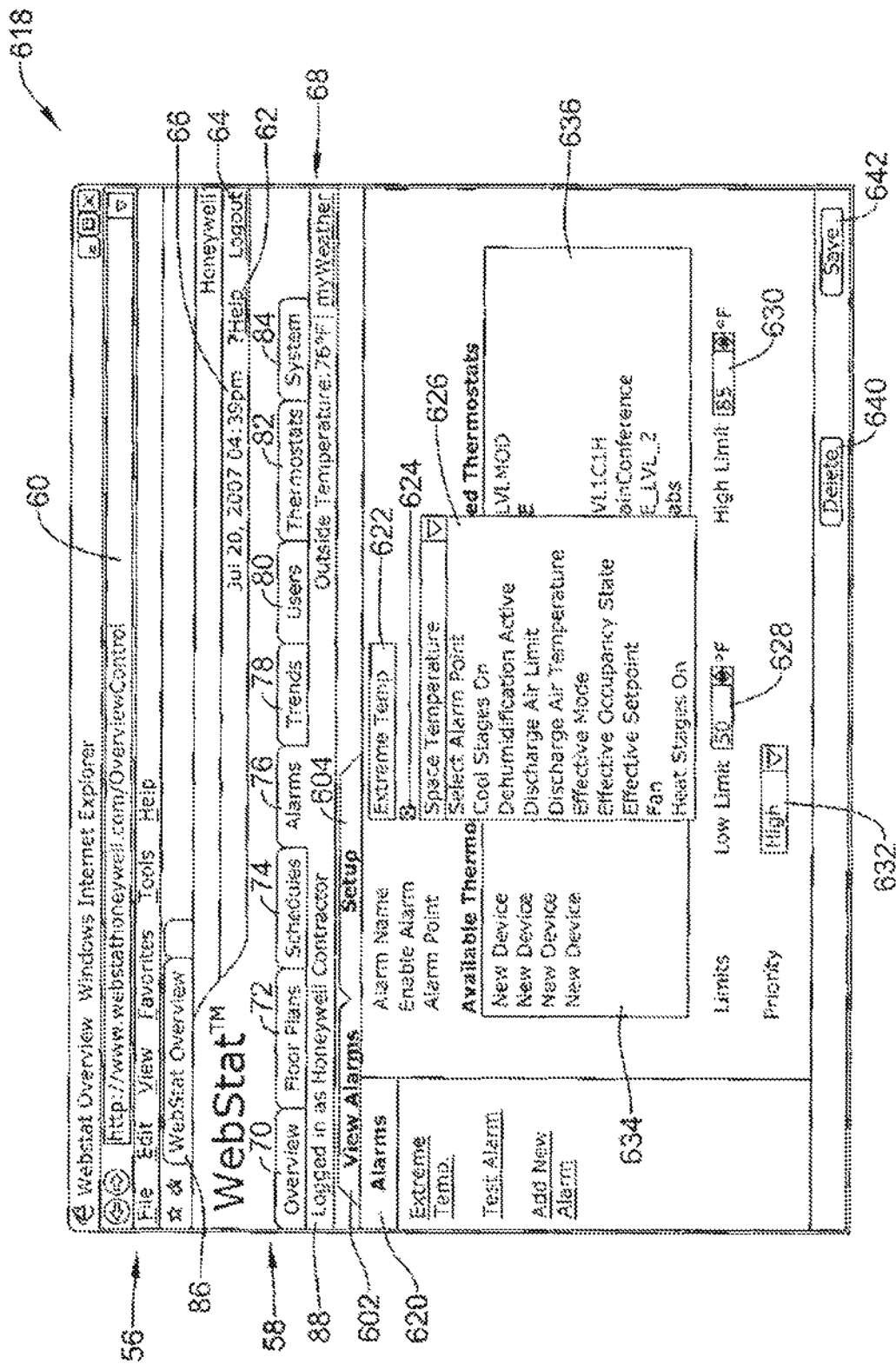


Figure 6C

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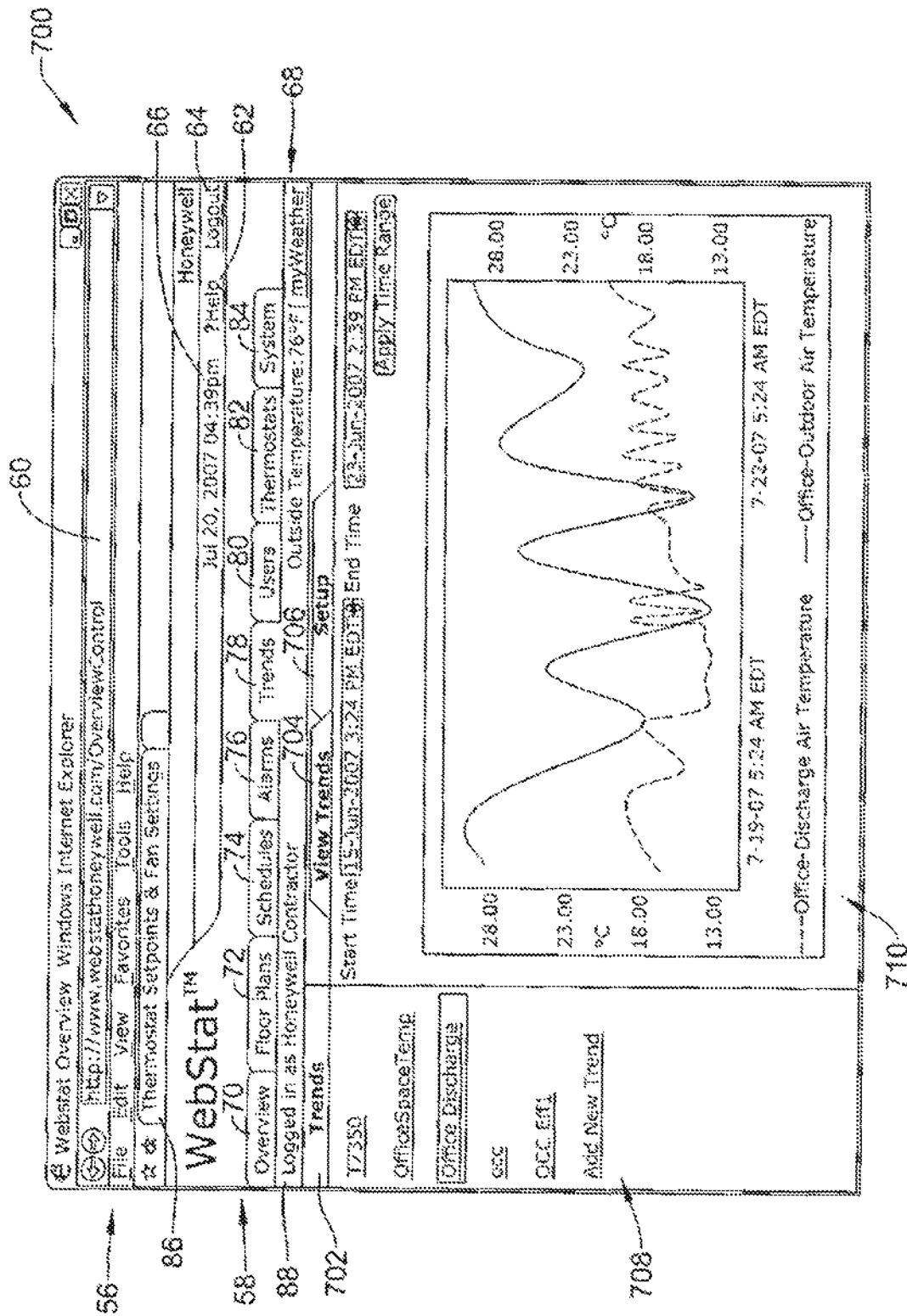


Figure 7A

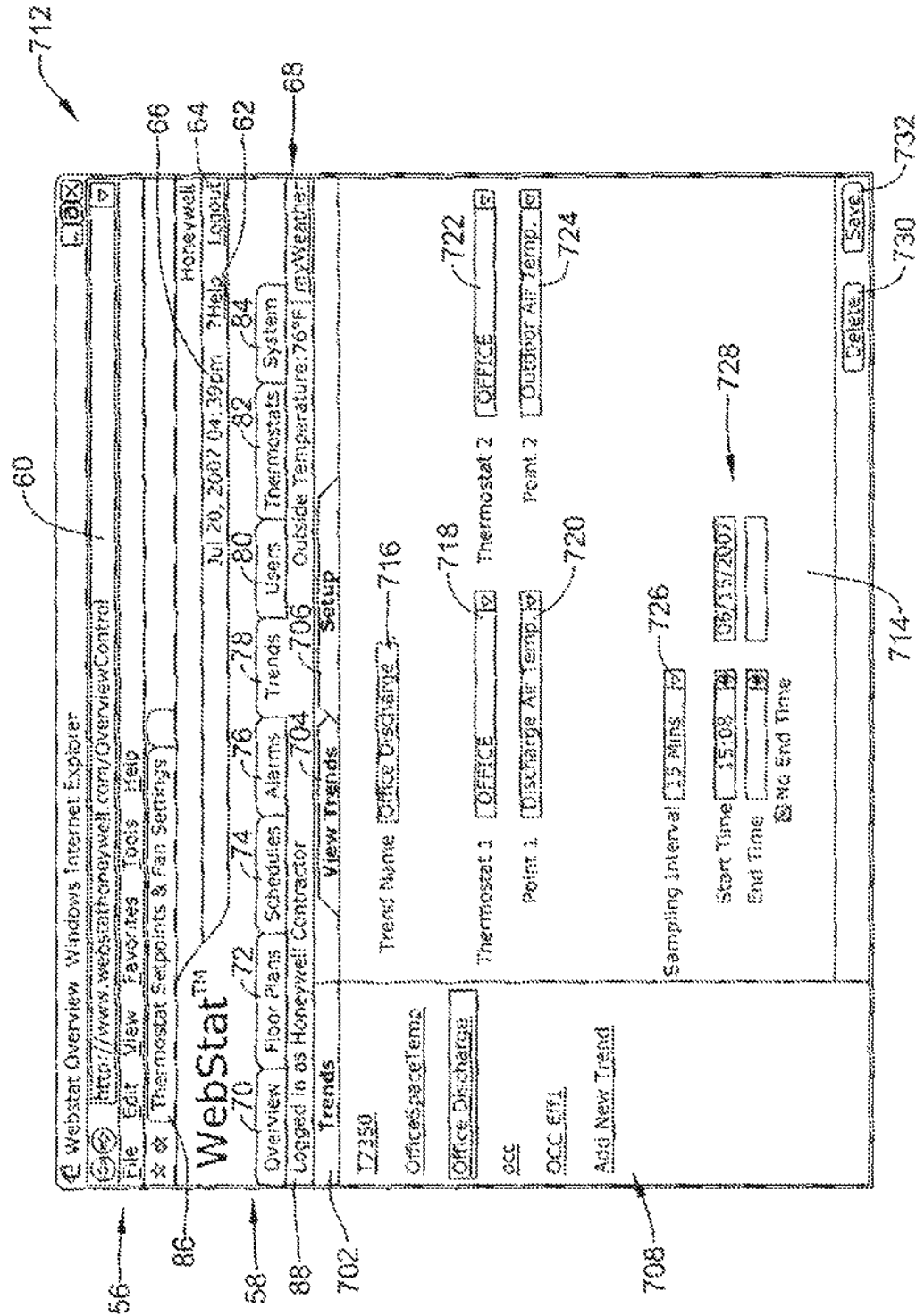


Figure 7B

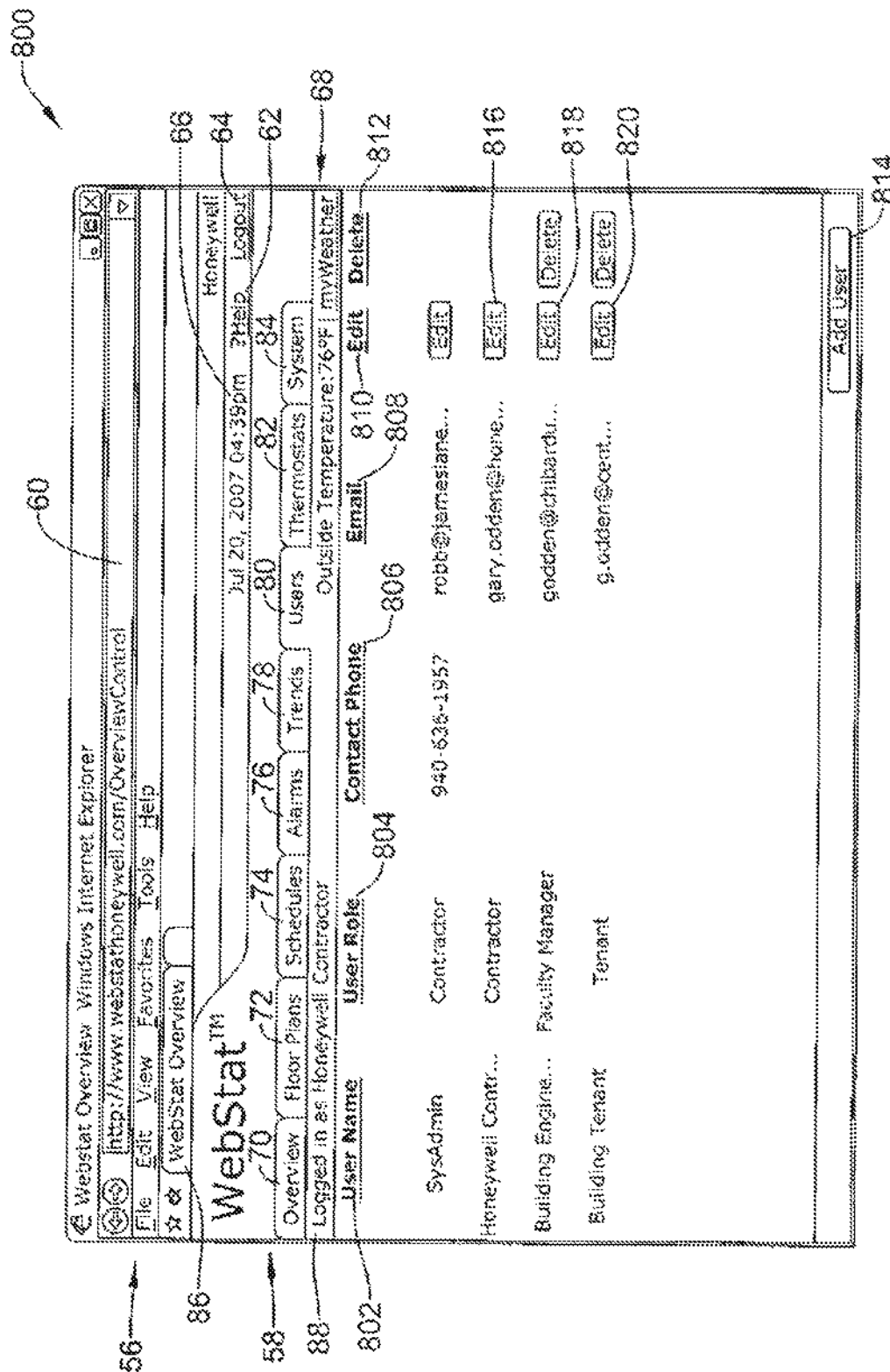


Figure 8A

Figure 8B is a screenshot of a web application interface titled "WebStat". The interface is displayed within a browser window (labeled 60) showing the address "http://www.webstat.honeywell.com/OverviewControl". The page layout includes a top navigation bar (labeled 66) with links: Overview, Floor Plans, Schedules, Alarms, Trends, Users, Thermostats, and System. Below this is a sub-navigation bar (labeled 68) with links: Thermostat Setpoints & Fan Settings, Properties, Assigned Thermostats, and Privileges. The main content area is divided into three sections: "User Name and Password" (labeled 832), "Confirm Information" (labeled 834), and "User Role" (labeled 836). The "User Name and Password" section contains fields for User Name (Honeywell Contractor), User ID (Honeywell), Password (*****), Confirm Password (*****), Password Reminder (What's your pet's name?), and Password Reminder Answer (*****). The "Confirm Information" section contains fields for Contact Phone (Ext.), Text Message Email, and Email. The "User Role" section contains fields for User Role, Alarm Priority (High, Medium, Low), and Enable Alarm Emailing (Yes, No). A "Save" button (labeled 838) is located at the bottom right of the form. The page also shows a status bar at the bottom (labeled 824) with the text "Logged in as Honeywell Contractor" and "Outside Temperature: 76°F | myWeather".

Figure 8B

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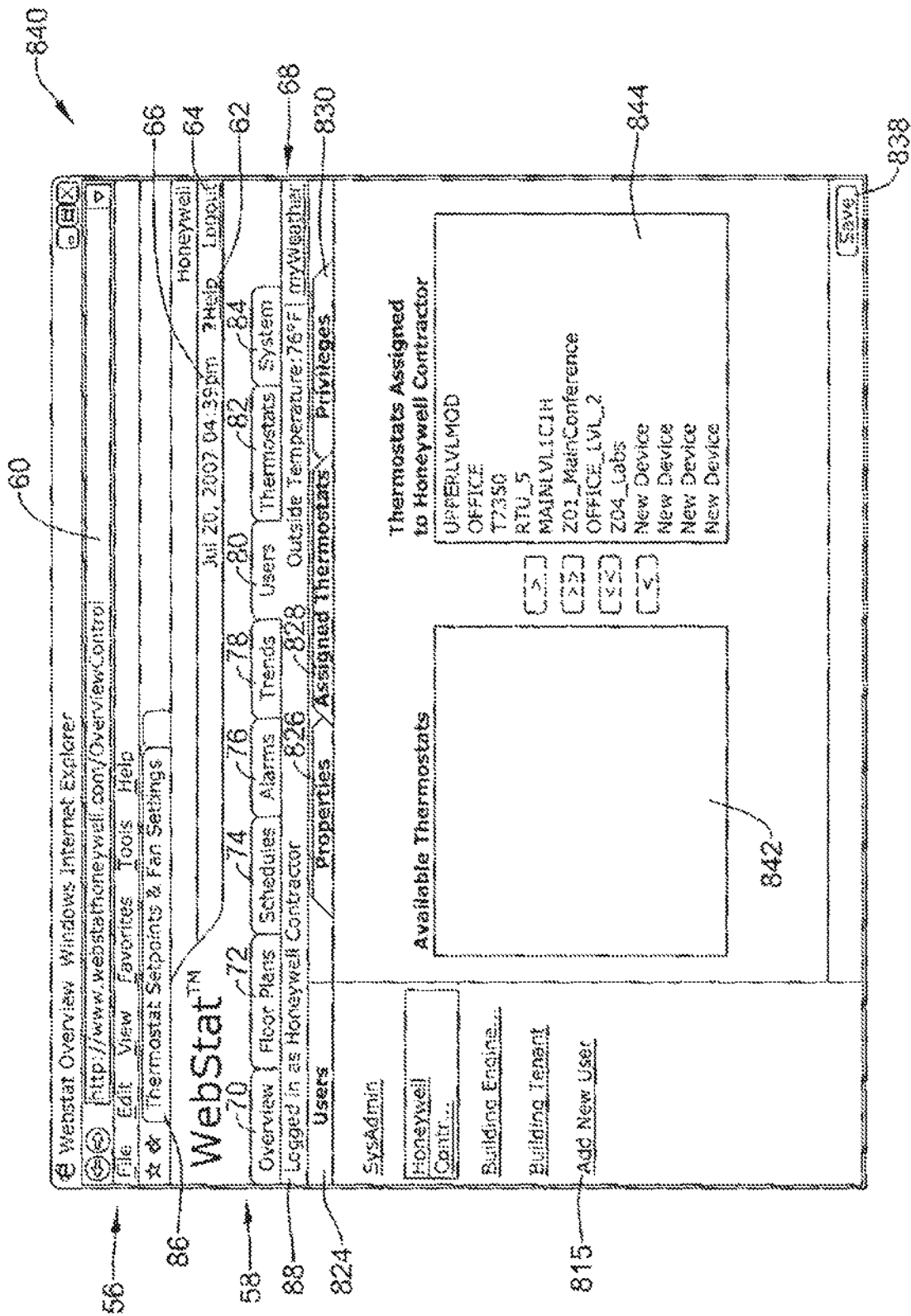


Figure 8C

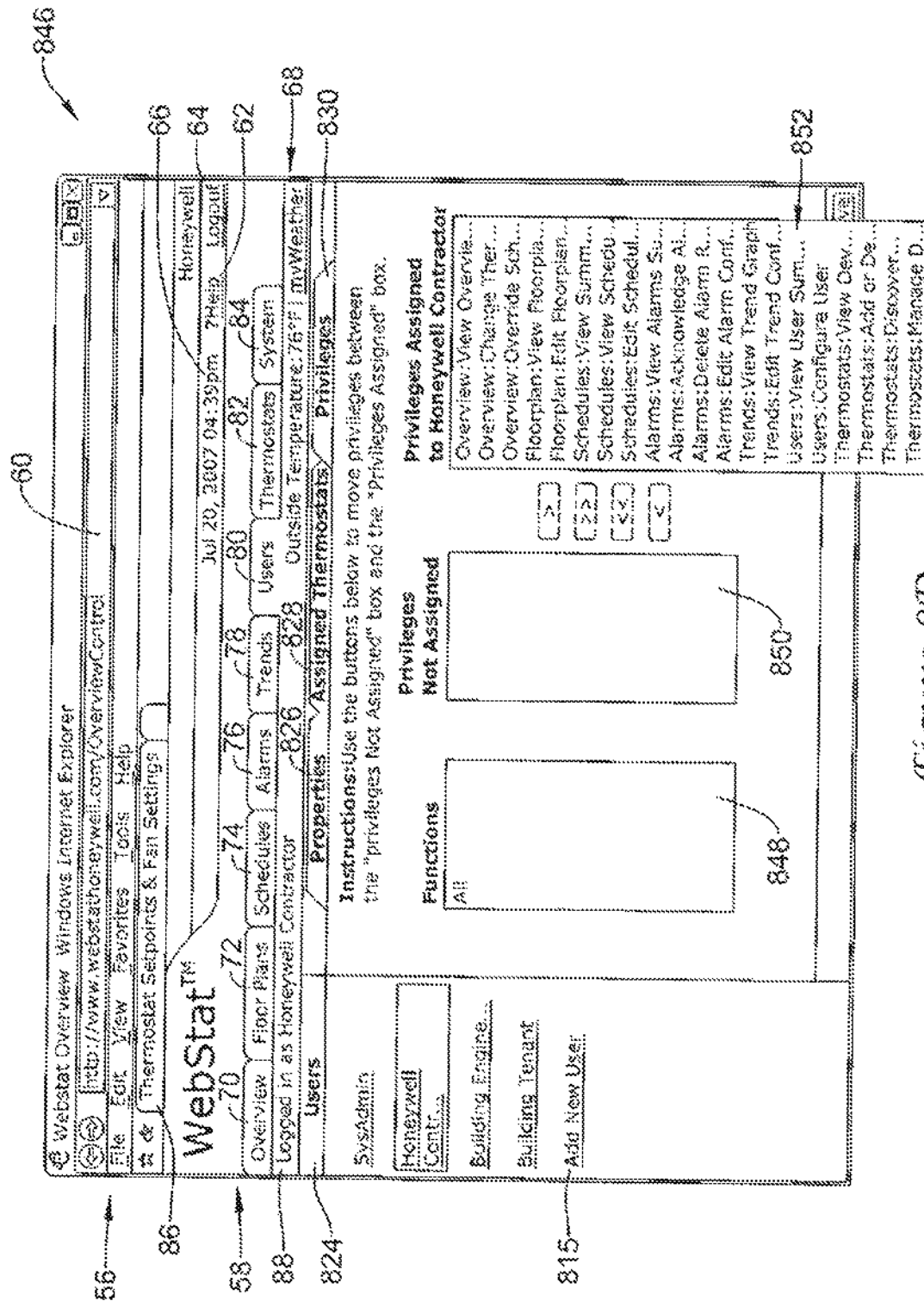


Figure 8D

Figure 8F is a screenshot of a web browser displaying the WebStat™ user interface. The browser window shows the address bar with "http://www.webstathoneywell.com/OverviewControl". The page has a top navigation bar with "WebStat™" and a "Users" menu. Below this is a "User Name and Password" section with fields for "User Name" (Building Engineer), "User ID" (Engineer), "Password" (*****), "Confirm Password" (*****), "Password Reminder" (What's your pet's name?), and "Password Reminder Answer" (*****). To the right is a "Confirm Information" section with fields for "Contact Phone" (Ext.), "Text Message Email", and "Email" (gooden@chibardun.net). Below these is a "User Role" section with "User Role" (Facility Manager), "Alarm Priority" (High Med. Low), and "Enable Alarm Emailing" (checked). At the bottom right are "Save" and "Delete" buttons. The page also includes a "Thermostat Setpoints & Fan Settings" section with tabs for "Overview", "Floor Plans", "Schedules", "Alarms", "Trends", "Users", "Thermostats", and "System". The "Overview" tab is active, showing "Logged in as Honeywell Contractor" and "Outside Temperature: 76°F". The "Thermostats" tab shows a table with columns for "Thermostat", "Setpoint", and "Fan Settings". The "Users" tab shows a list of users: SysAdmin, Honeywell Contr., Building Engineer, Building Tenant, and Add New User.

Figure 8F

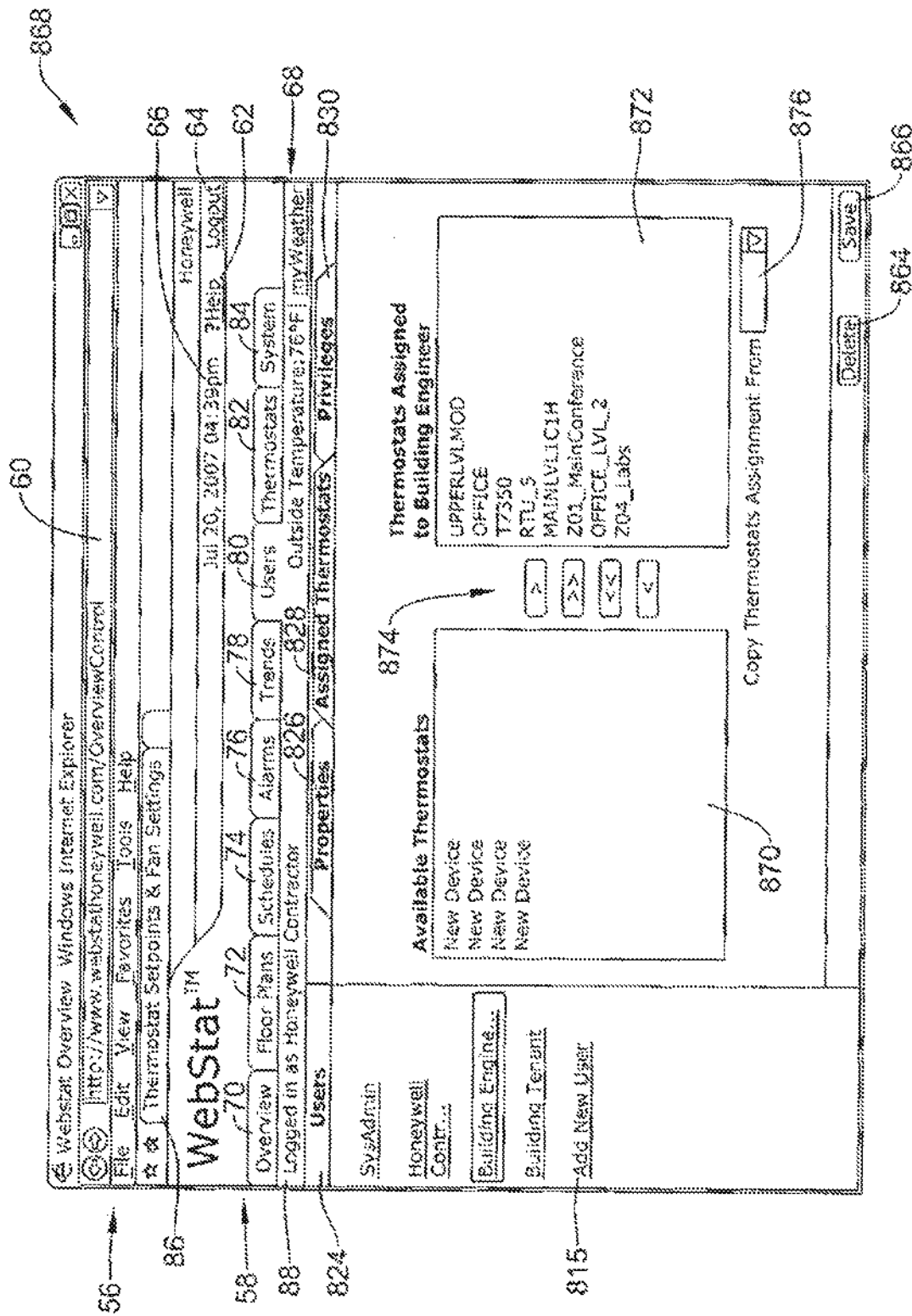
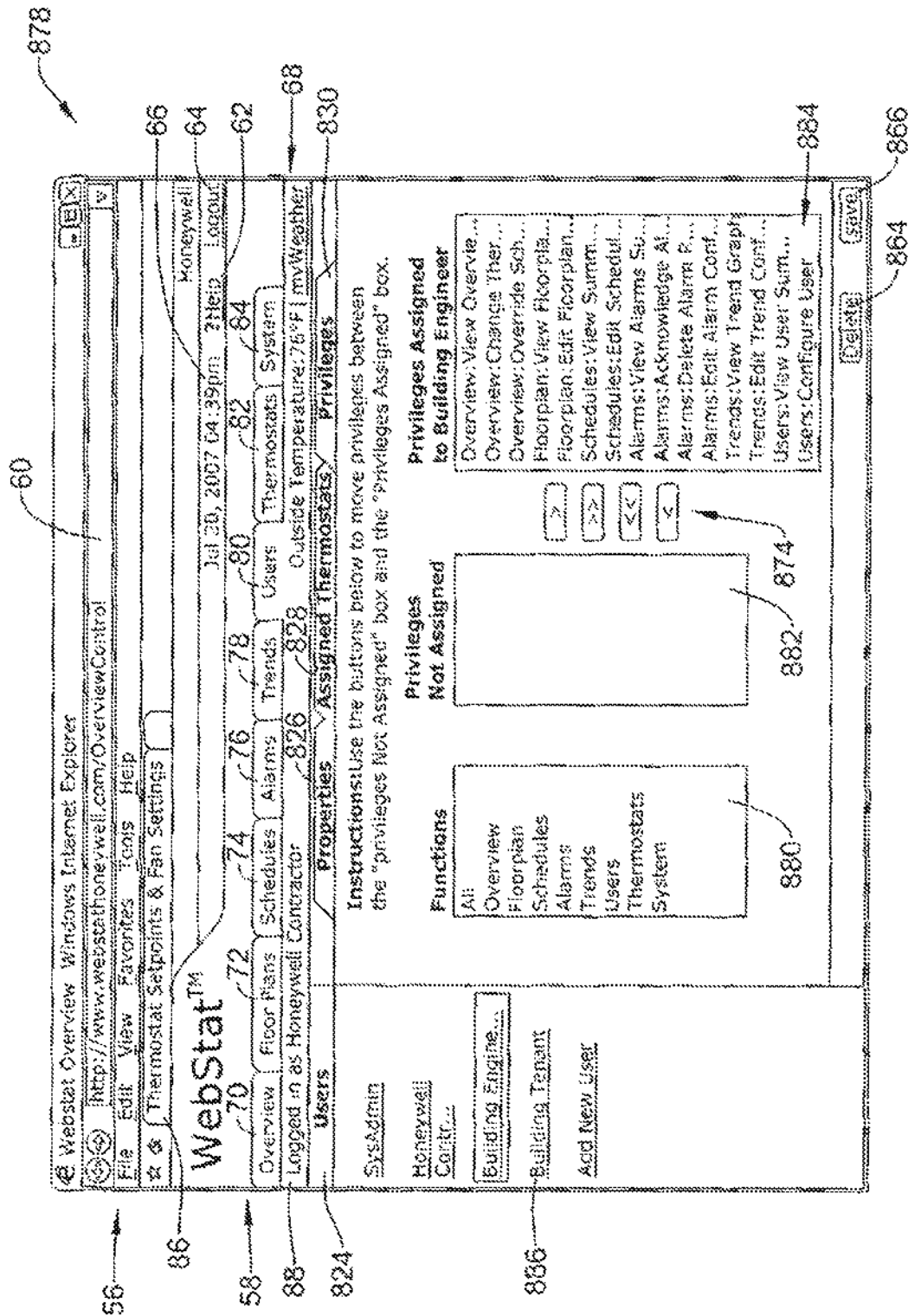


Figure 8F



5800

Figure 89H is a screenshot of a web browser displaying the WebStat™ interface. The browser window (56) shows the URL <http://www.webstat.honeywell.com/OverviewControl>. The page title is WebStat™ (86). The navigation bar (58) includes links for Overview, Floor Plans, Schedules, Alarms, Trends, Users, Thermostats, and System. The main content area (88) is divided into three sections: 'Users' (824) with links for SysAdmin, Honeywell Contr., Building Engineer, Building Tenant, and Add New User; 'Properties' (826) with links for Assigned Thermostats and Privileges; and 'Thermostats' (828) showing 'Outside Temperature: 76°F' and 'myWeather'. A sidebar (66) contains links for Thermostat Setpoints & Fan Settings, Honeywell, and Logout. The bottom section (830) contains three panels: 'User Name and Password' (859) with fields for User Name, User ID, Password, Confirm Password, Password Reminder, Question, and Answer; 'Confirm Information' (861) with fields for Contact Phone, Text Message Email, and Email; and 'User Role' (863) with fields for User Role, Alarm Priority, and Enable Alarm Emailing. A 'Save' button (866) is at the bottom right.

Figure 89H

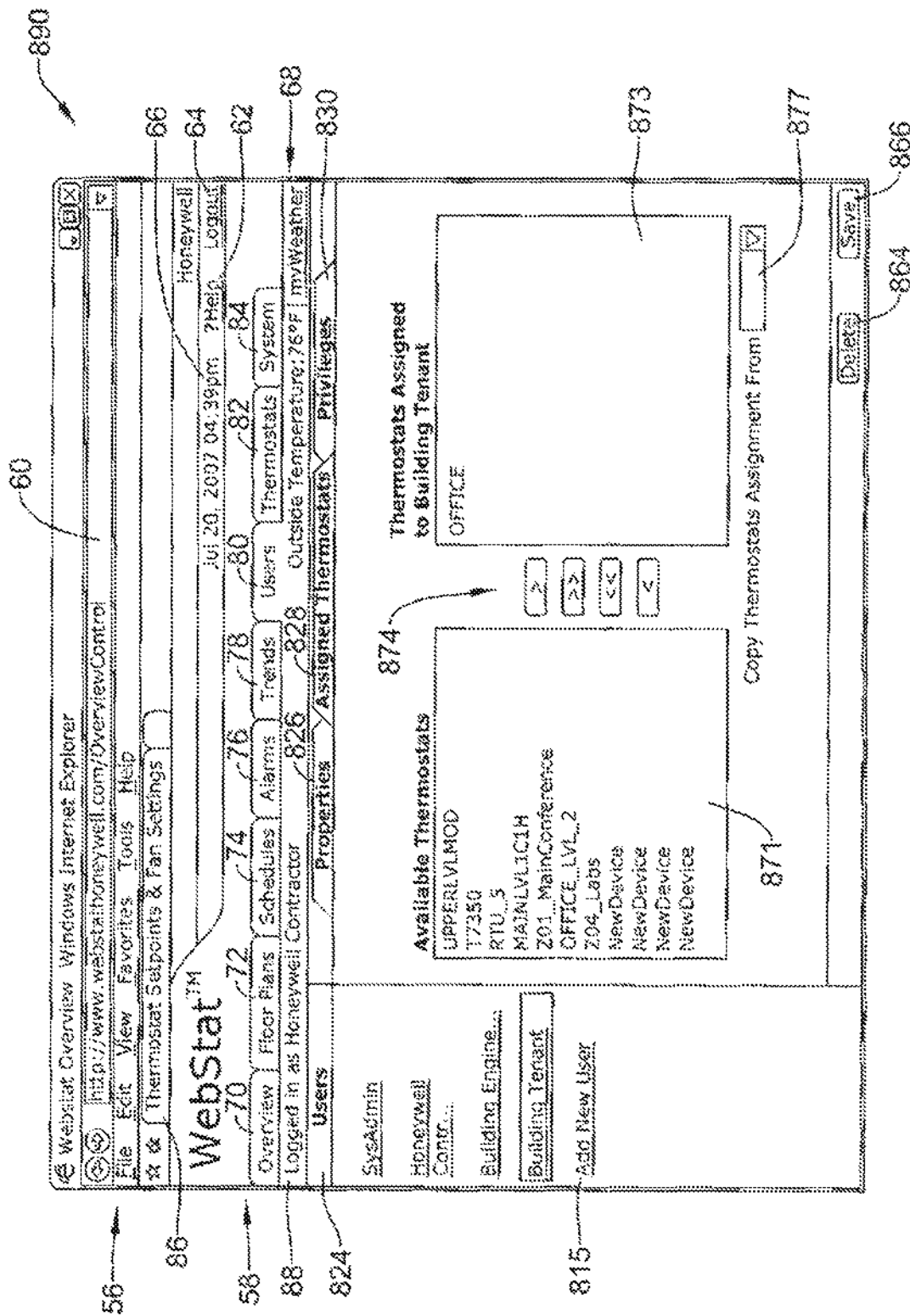


Figure 81

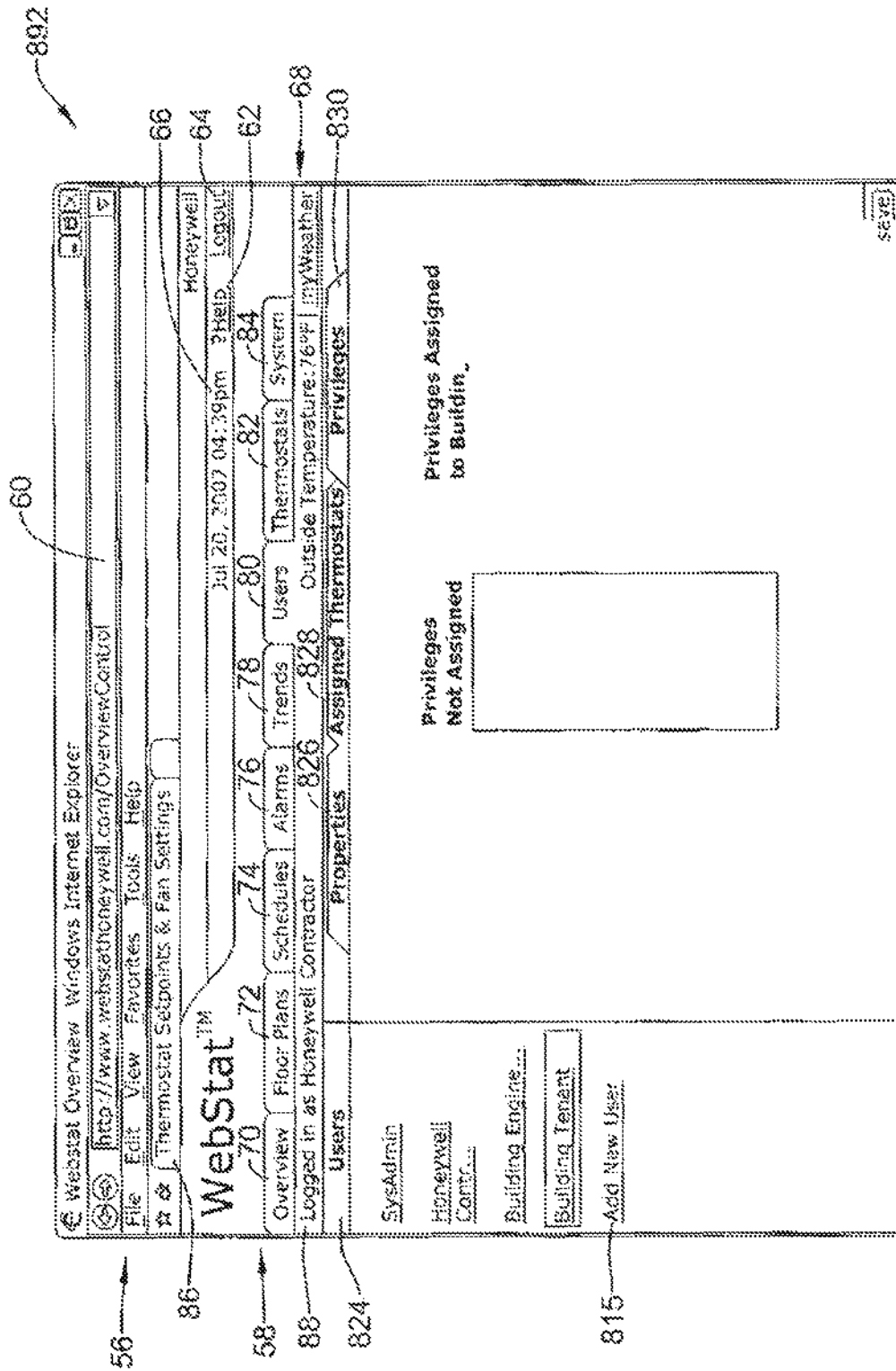


Figure 8J

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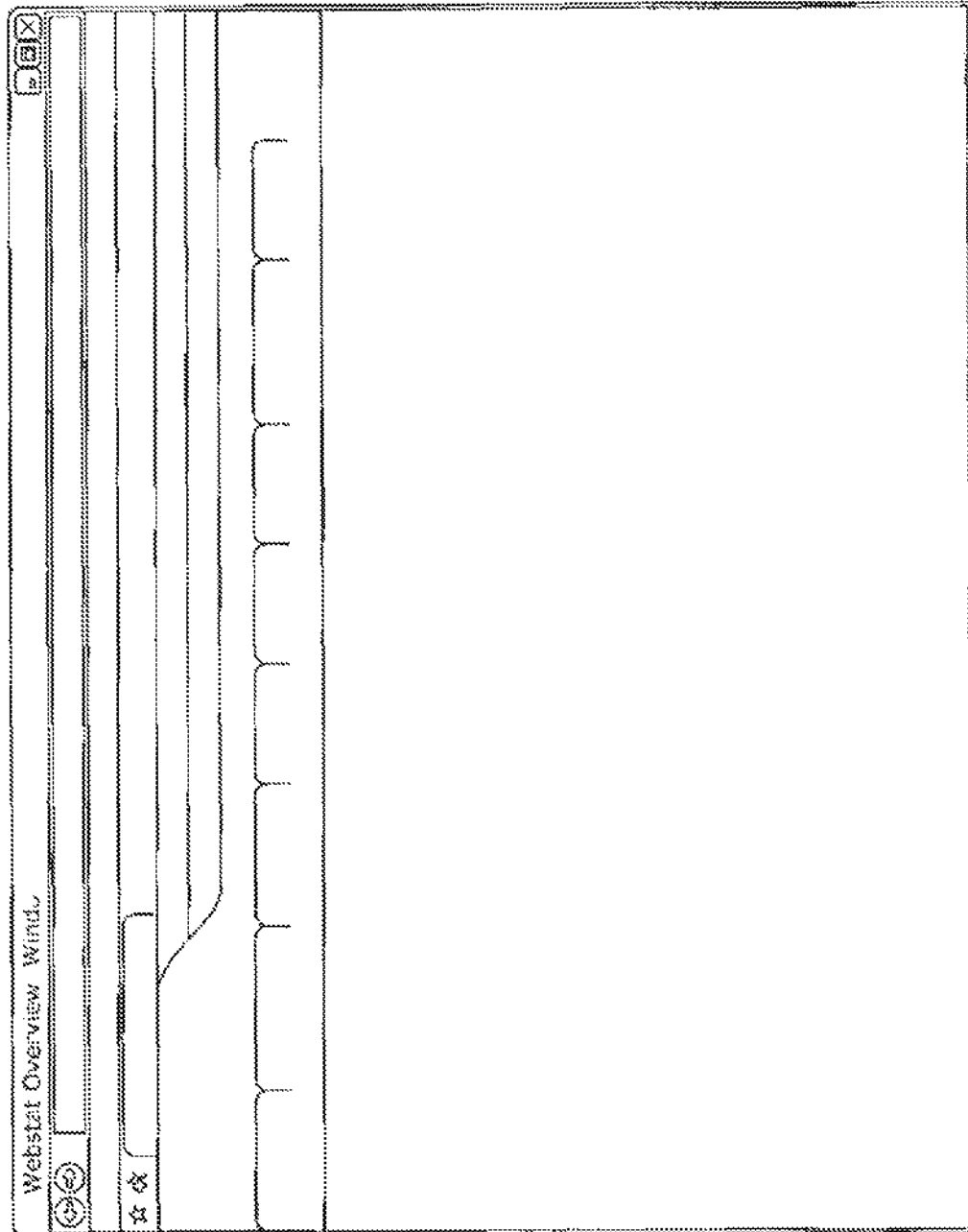


Figure 9A

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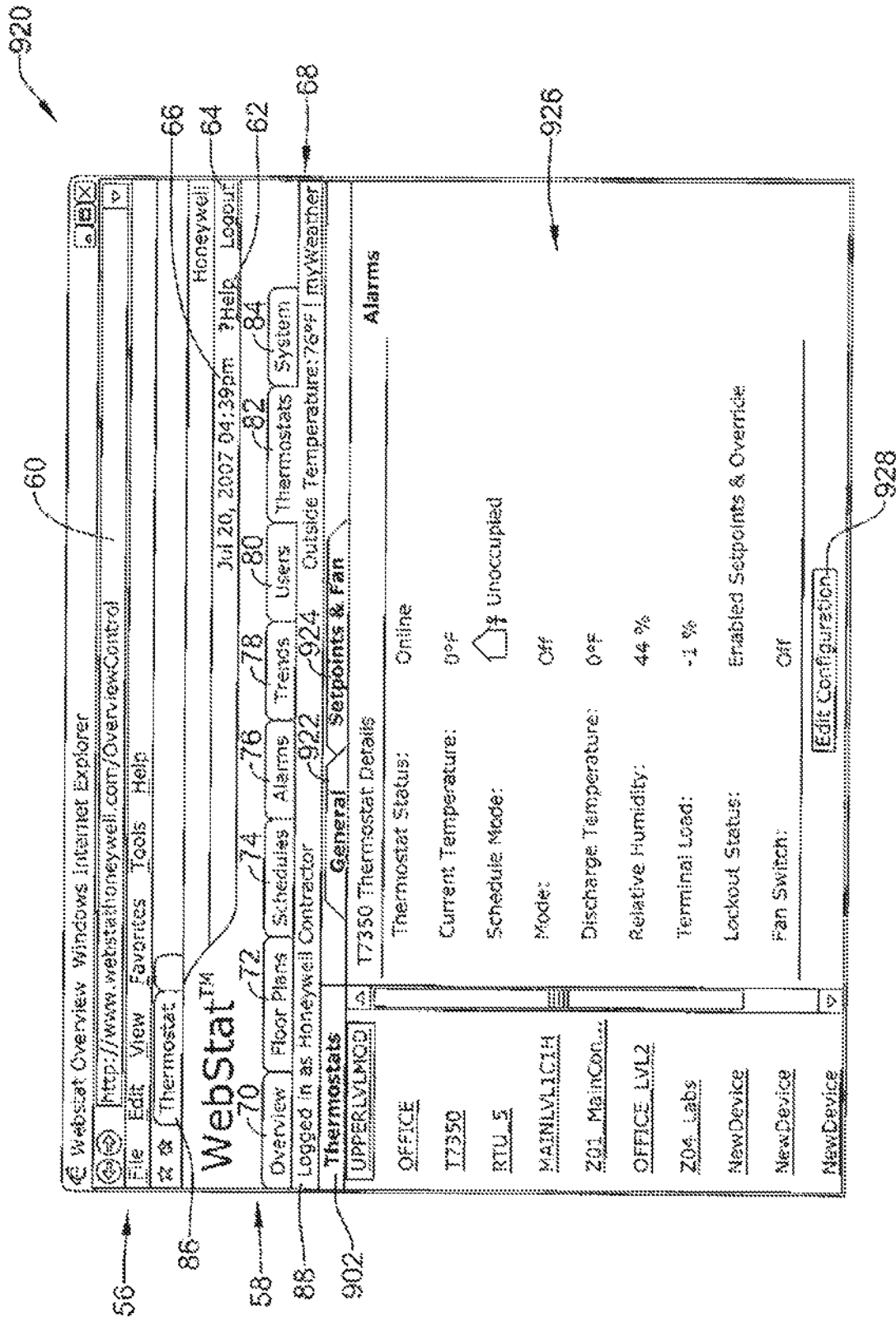


Figure 9B

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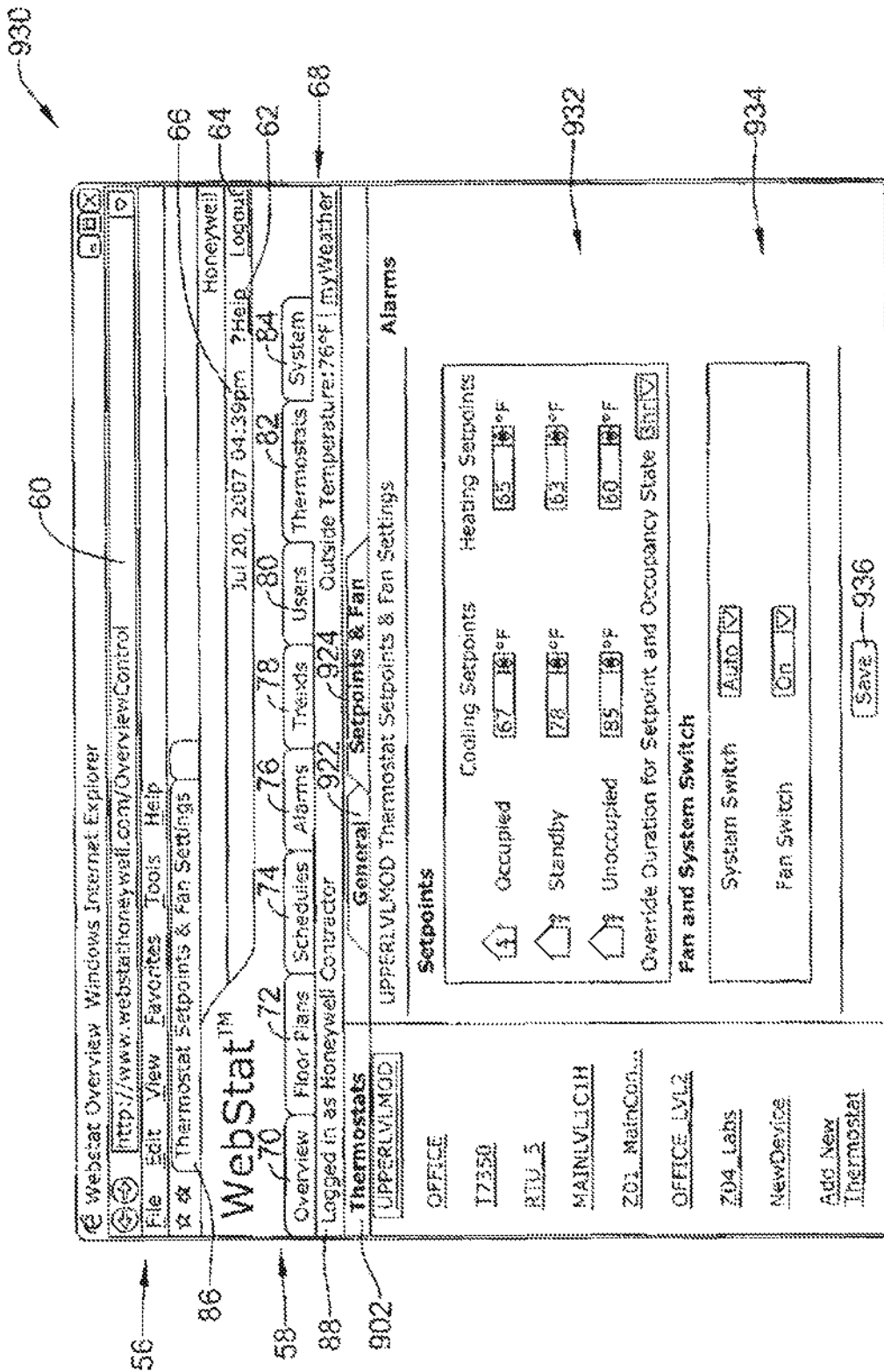


Figure 9C

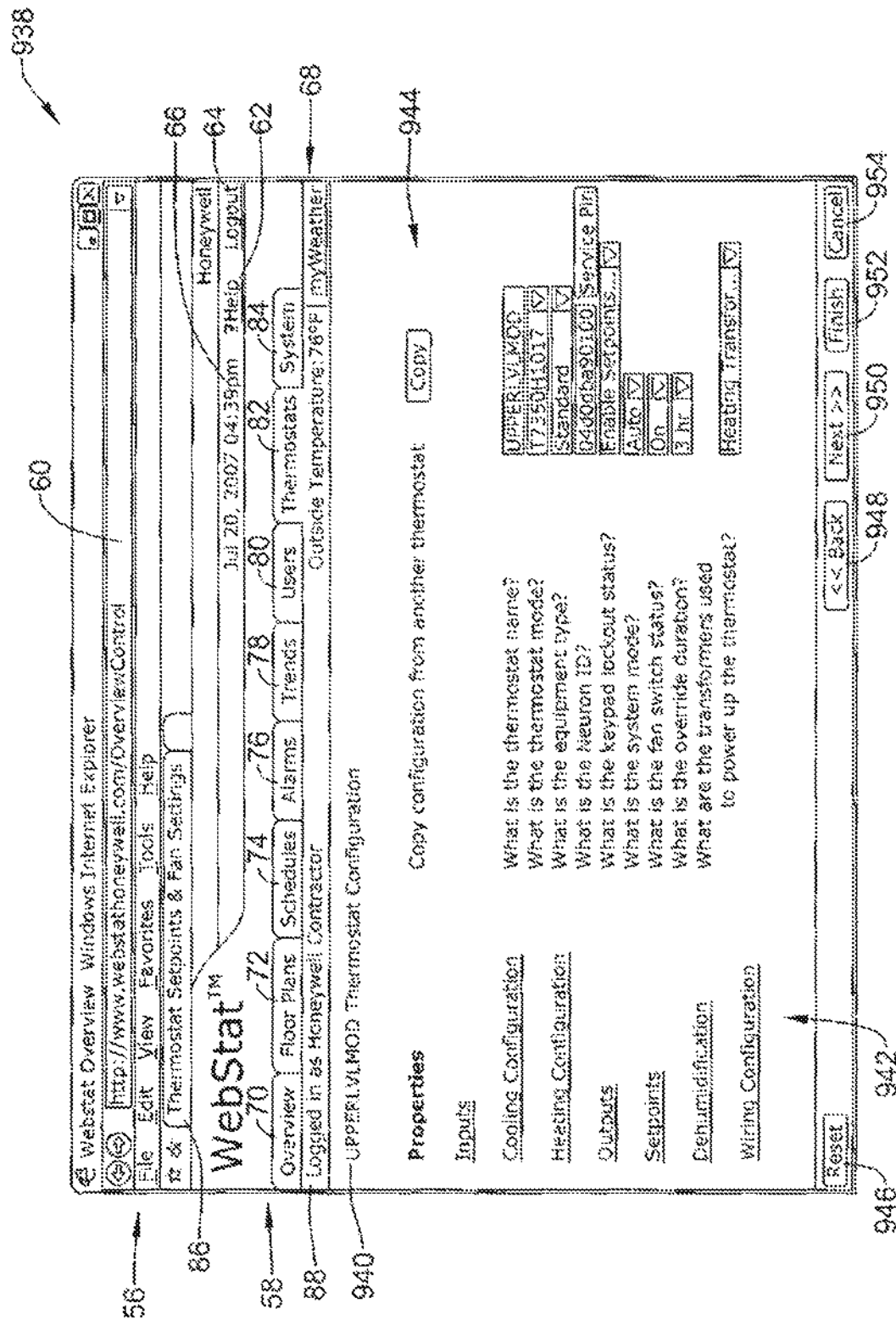


Figure 9D

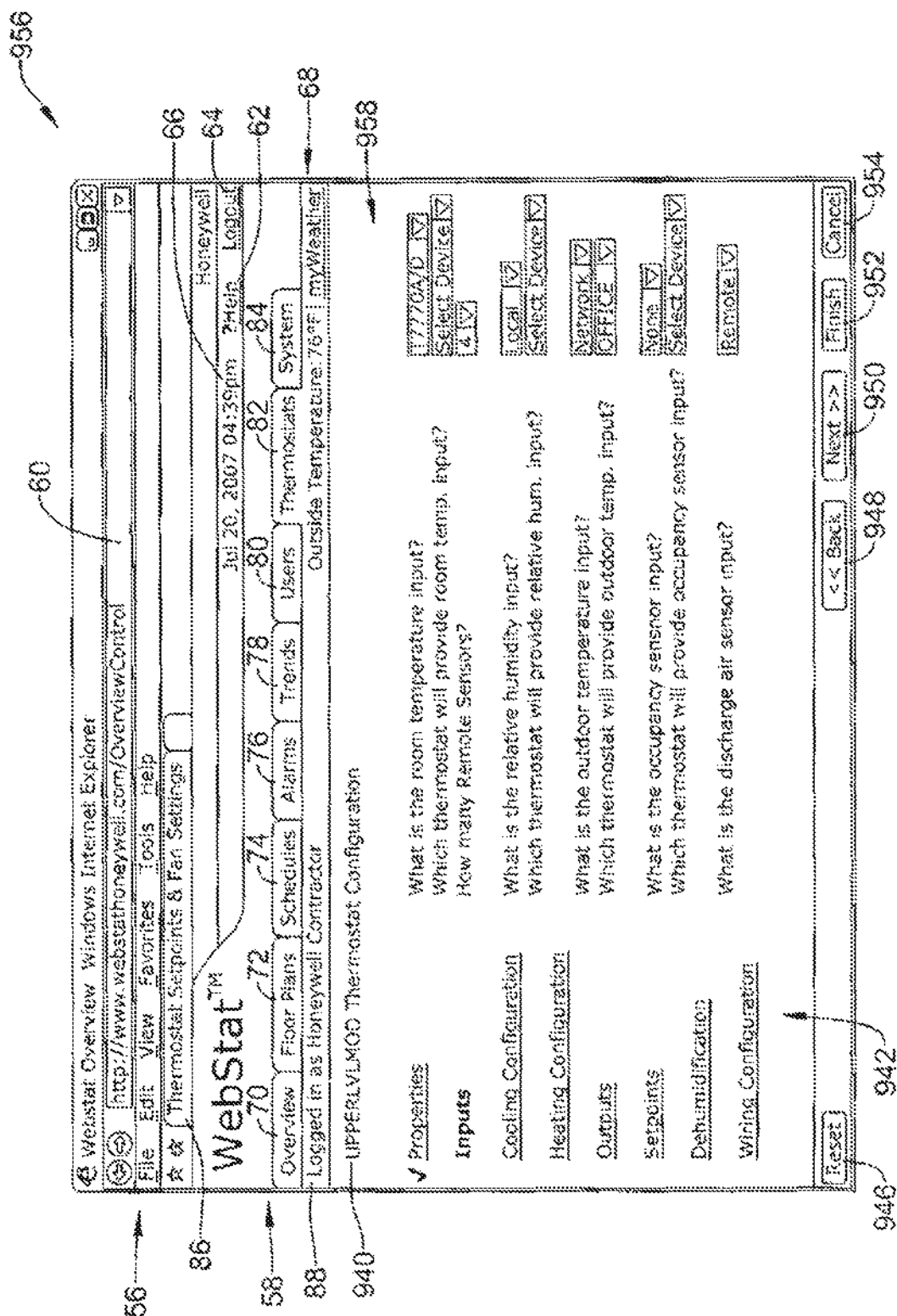


Figure 9E

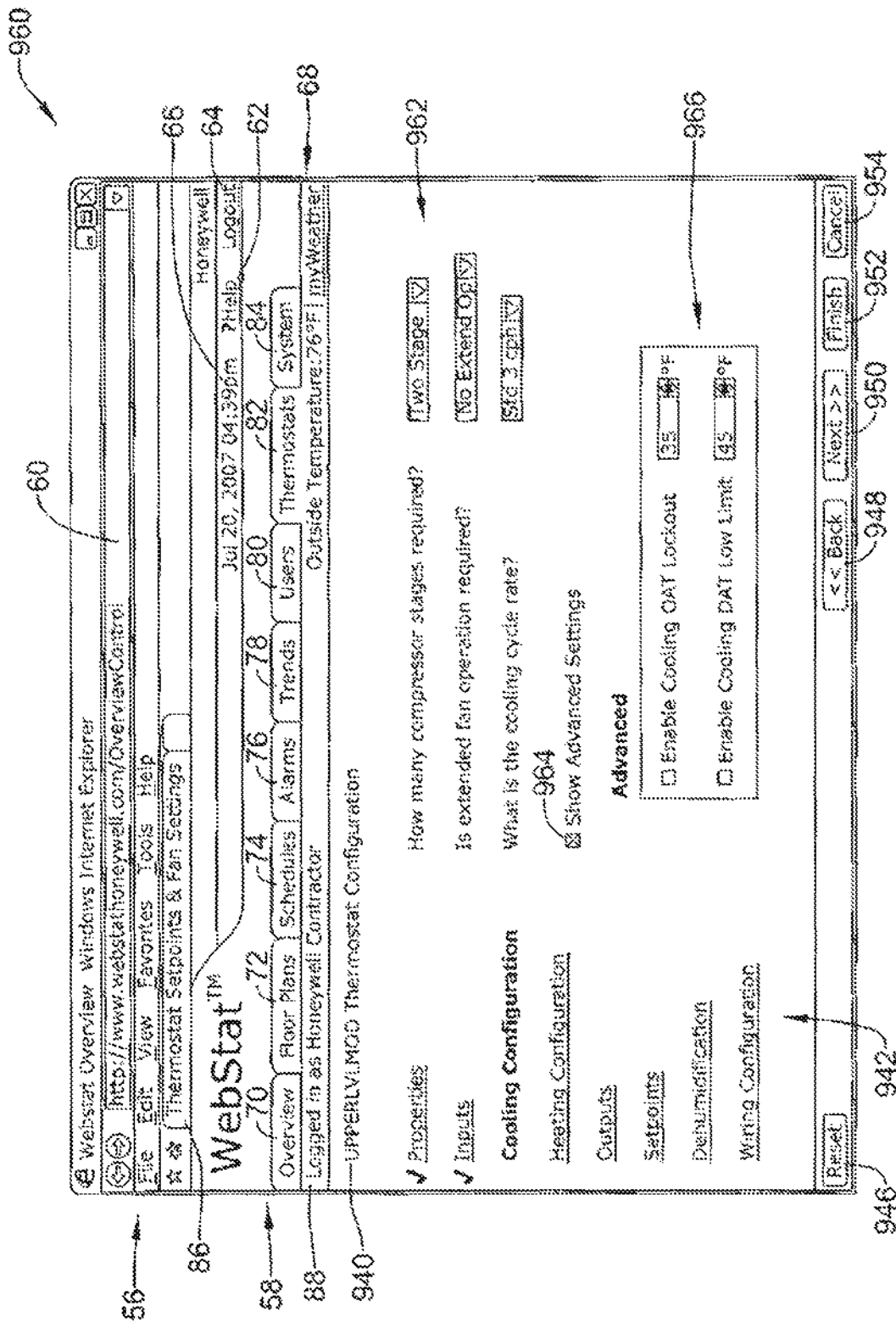


Figure 9F

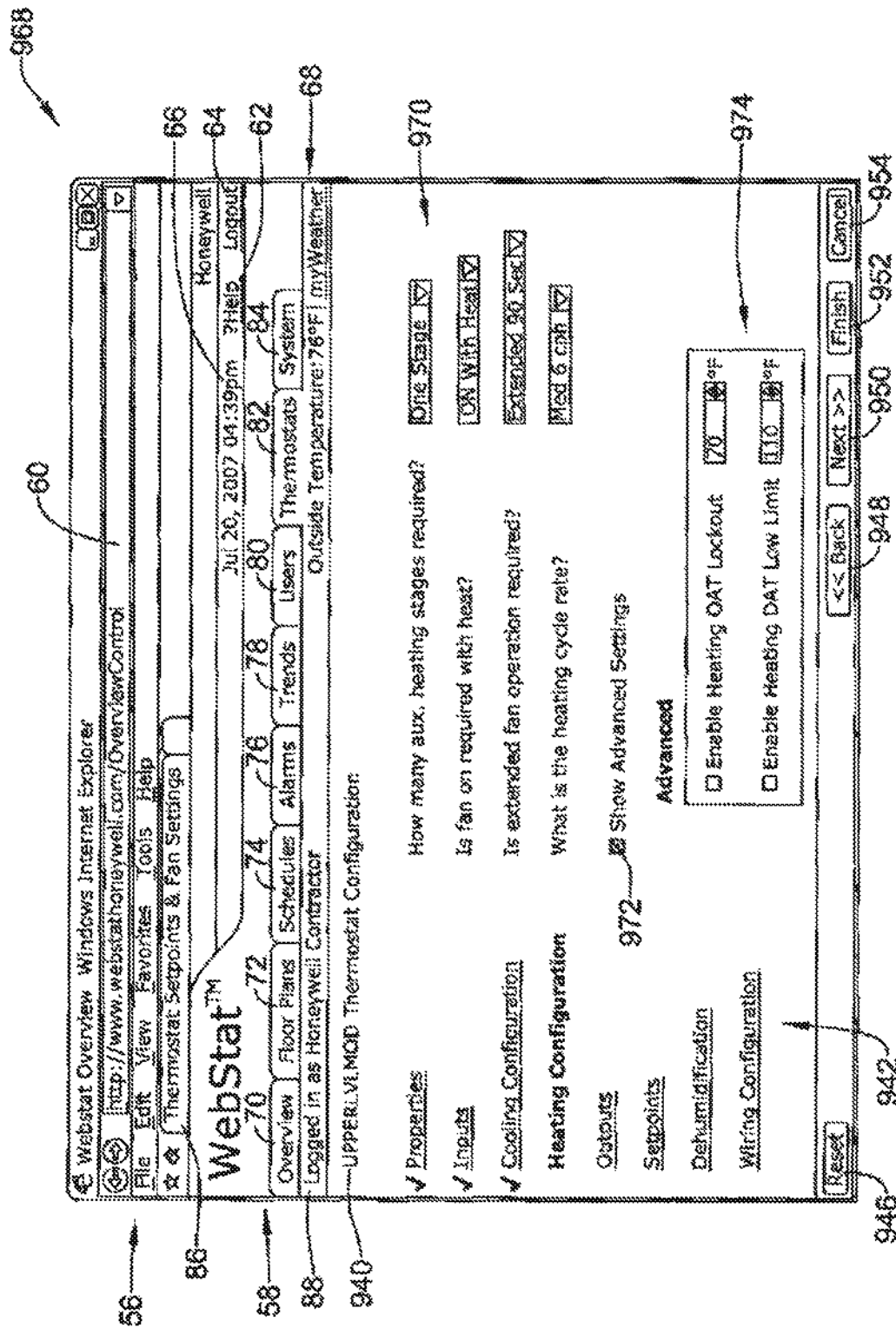


Figure 99

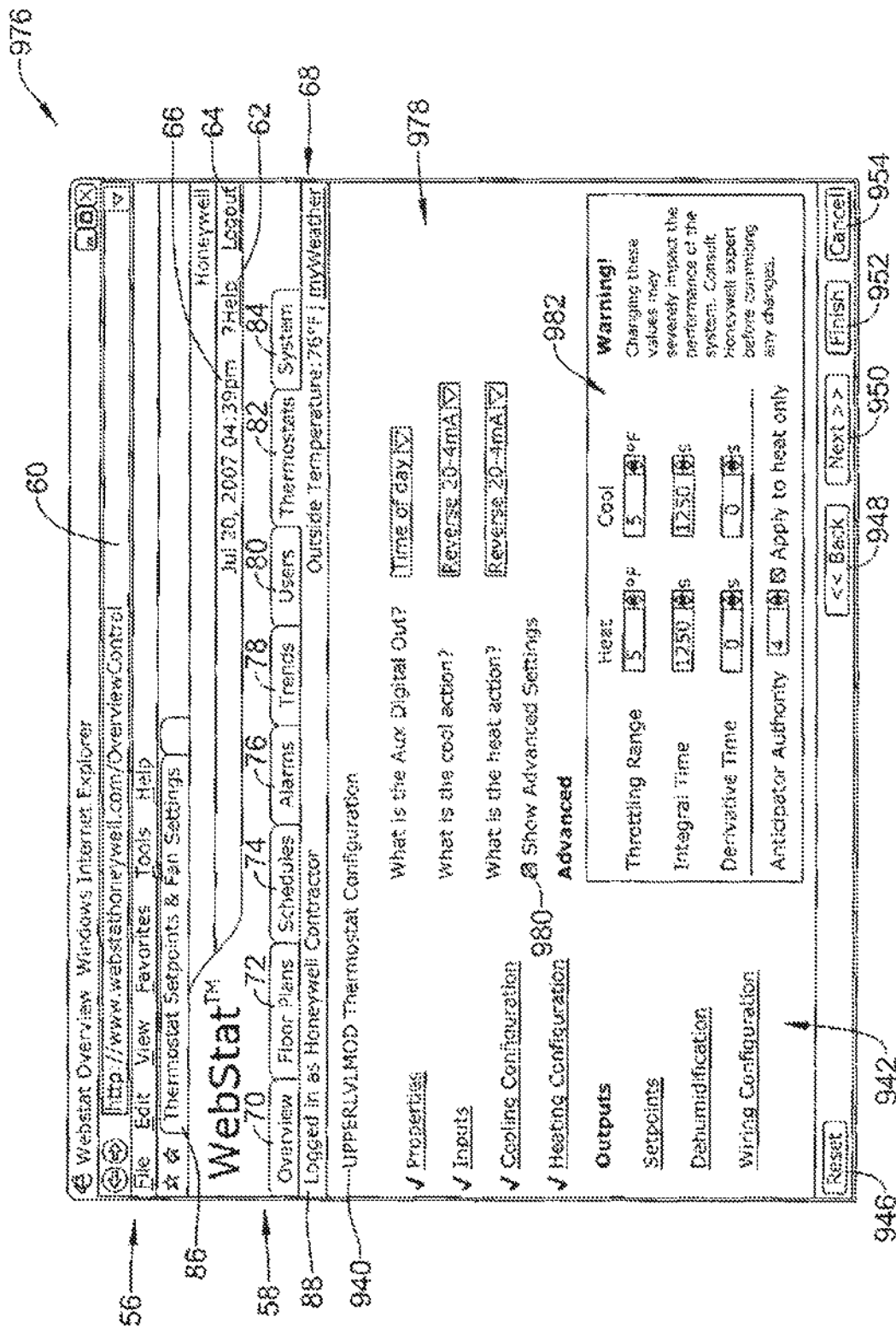


Figure 93f

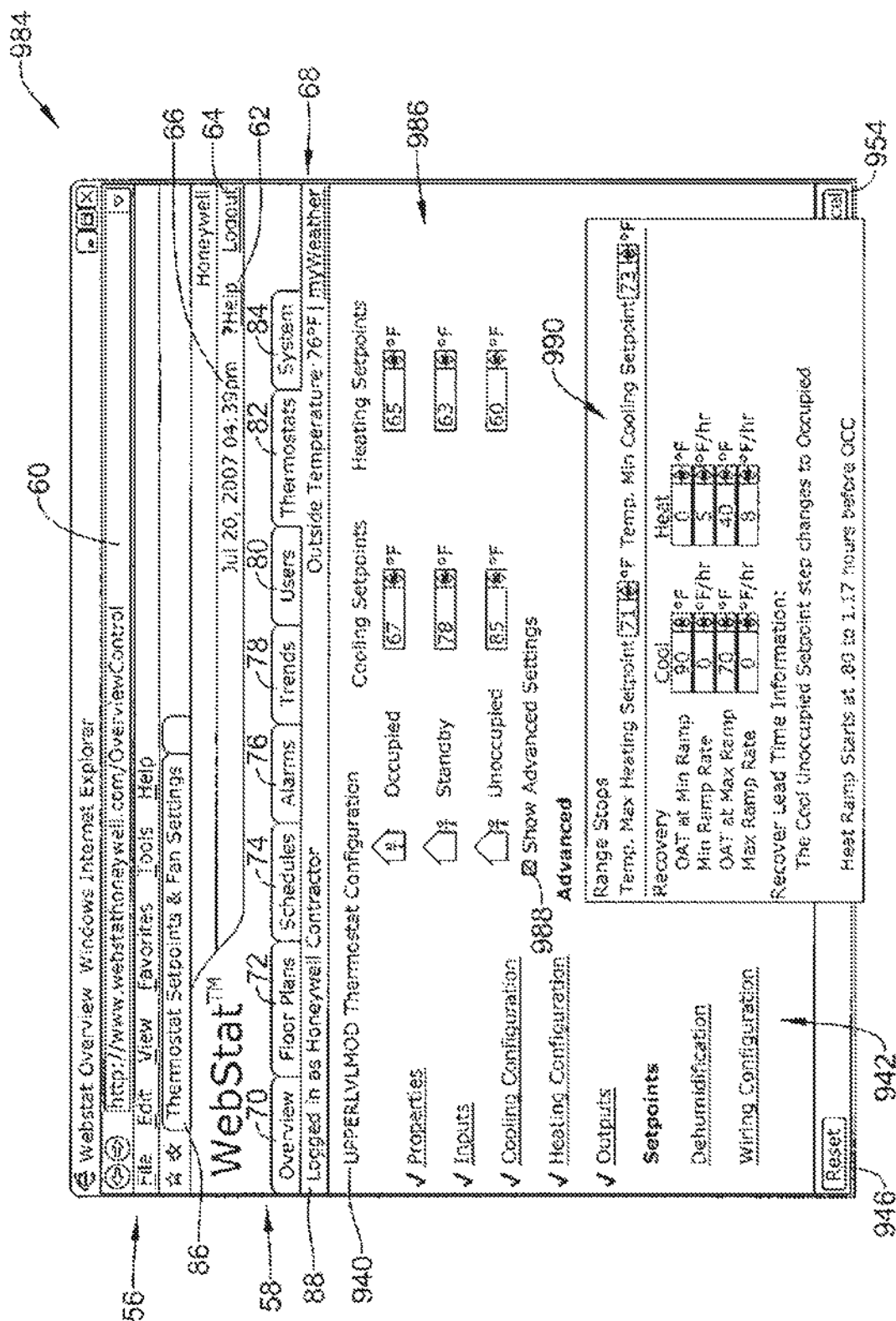


Figure 91

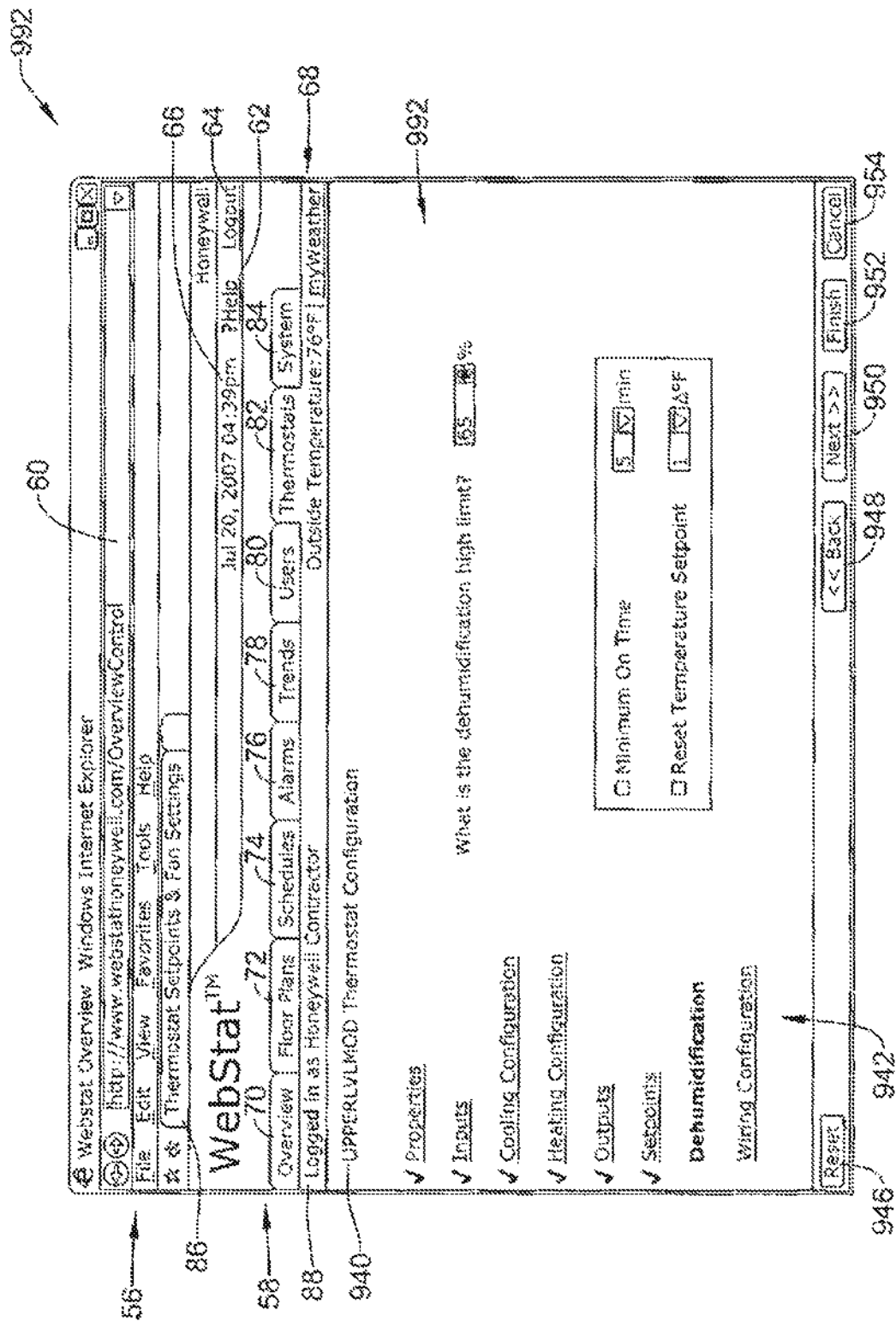


Figure 9J

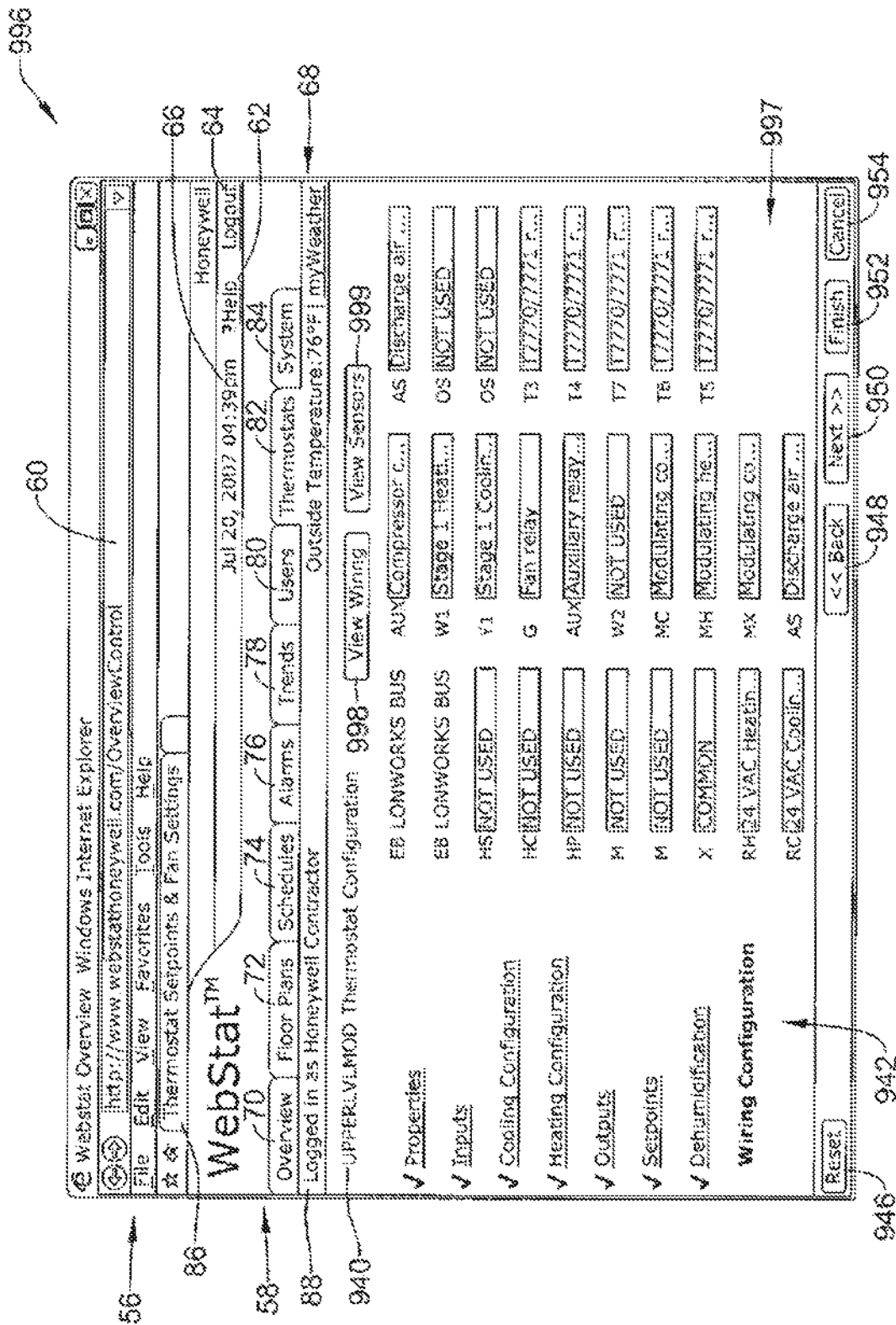
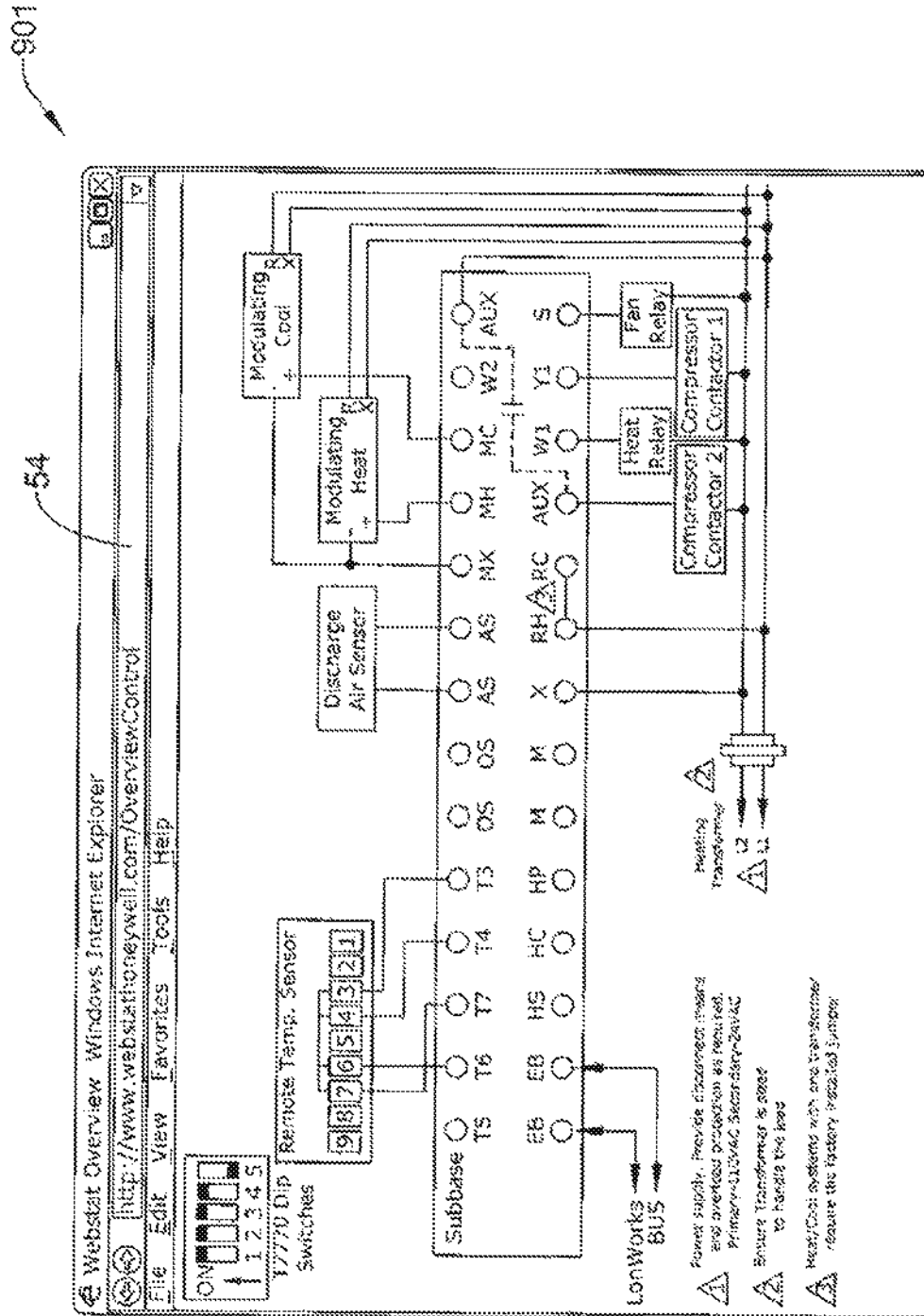


Figure 9K



To and

903

54

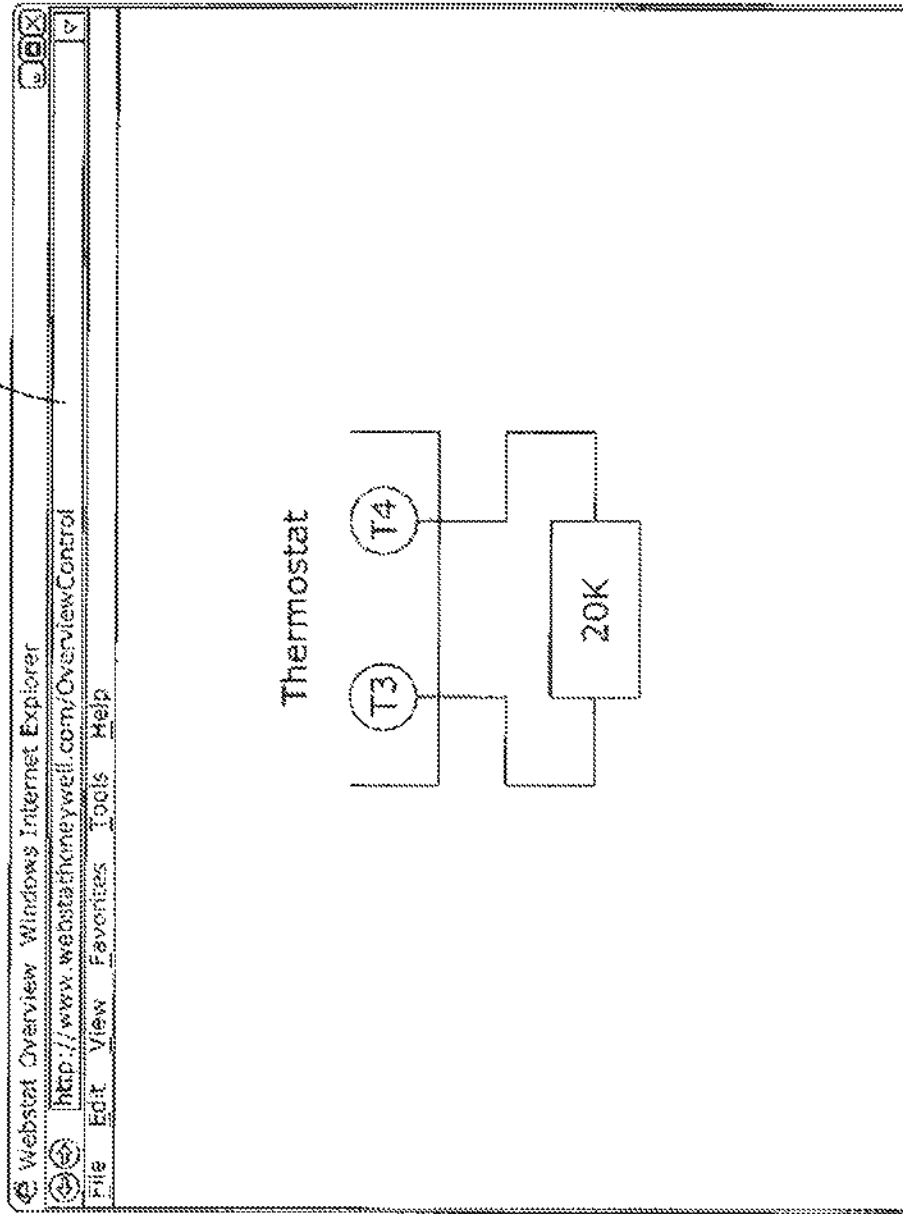


Figure 9M

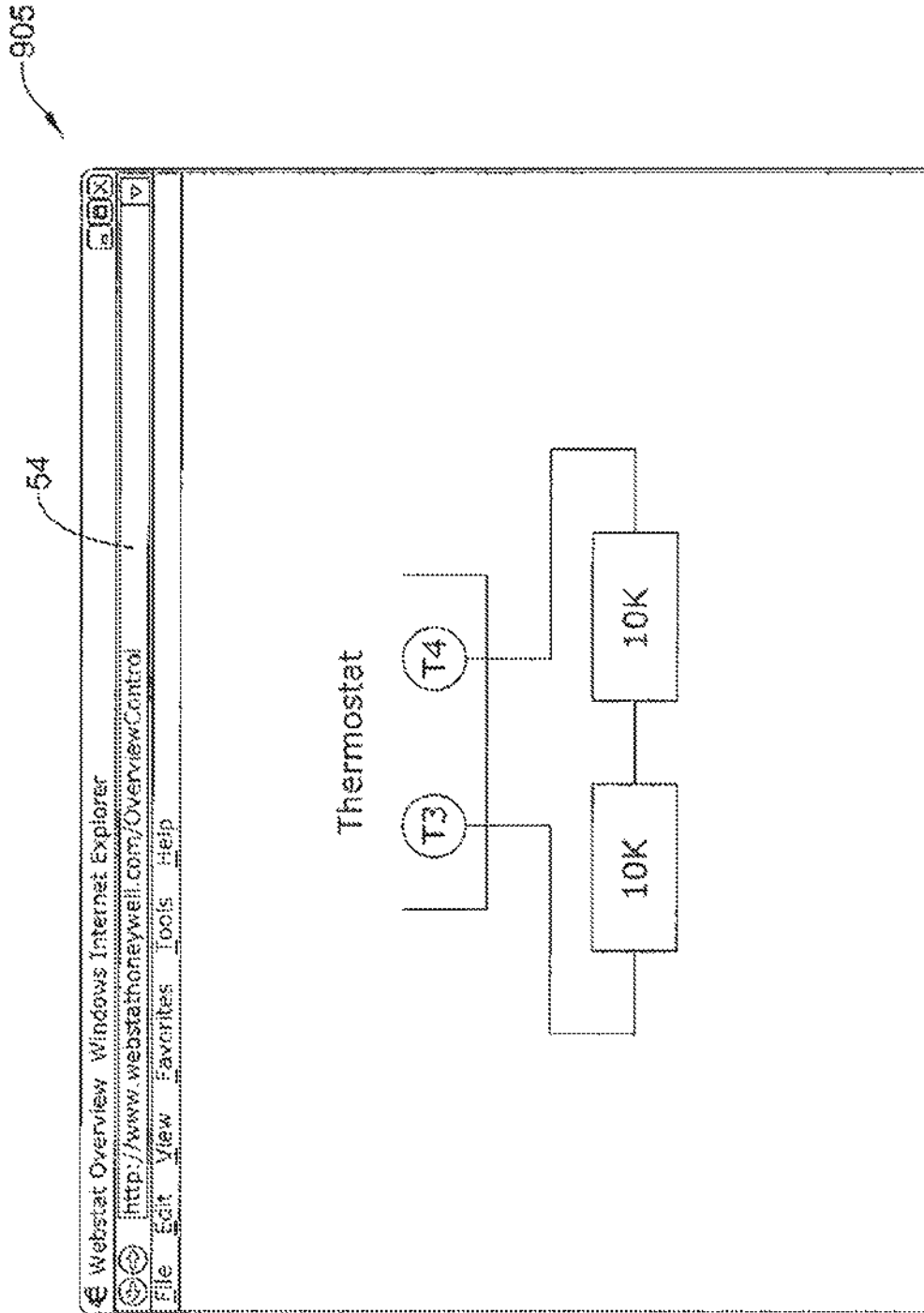
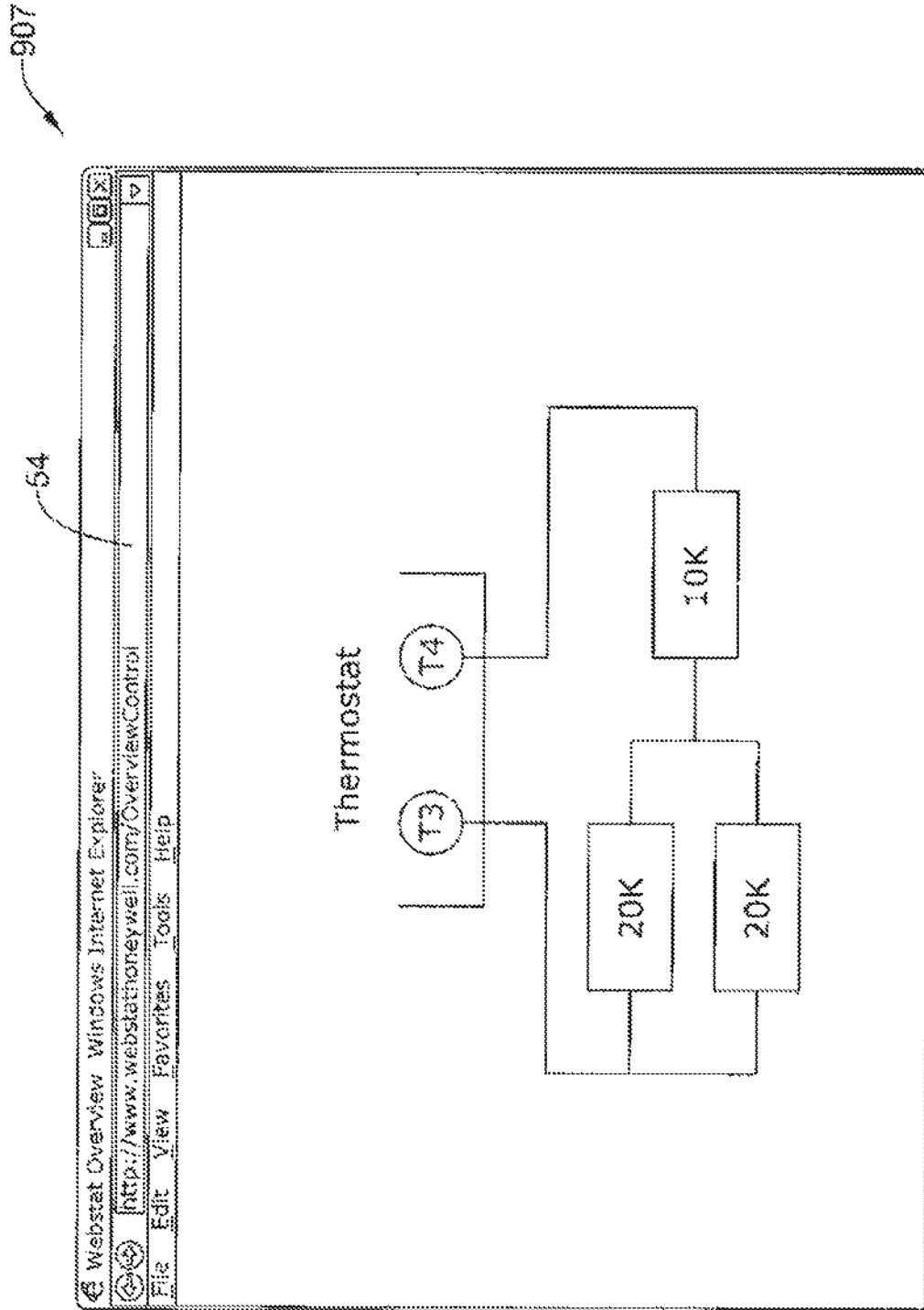
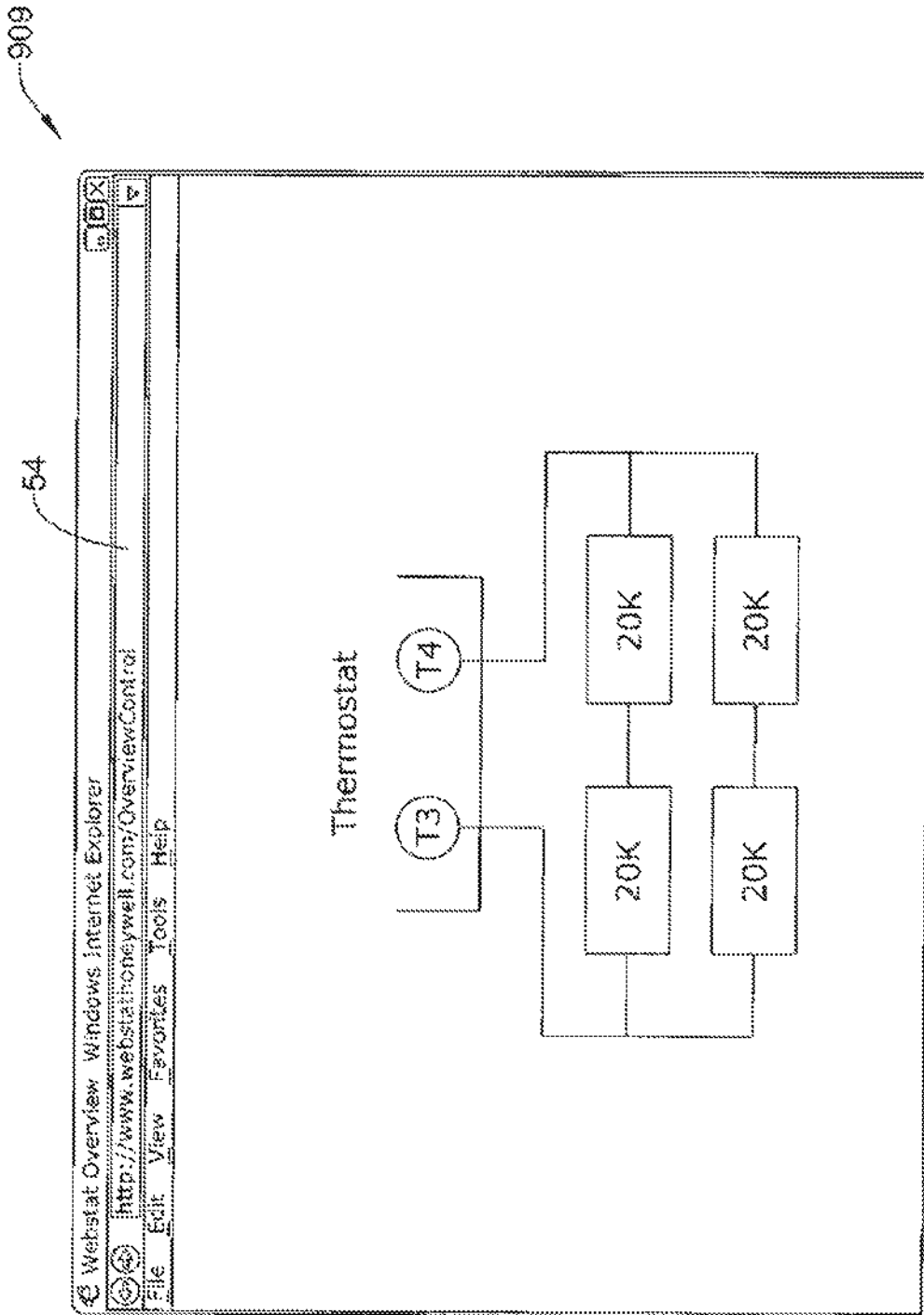


Figure 9N

*Figure 90*



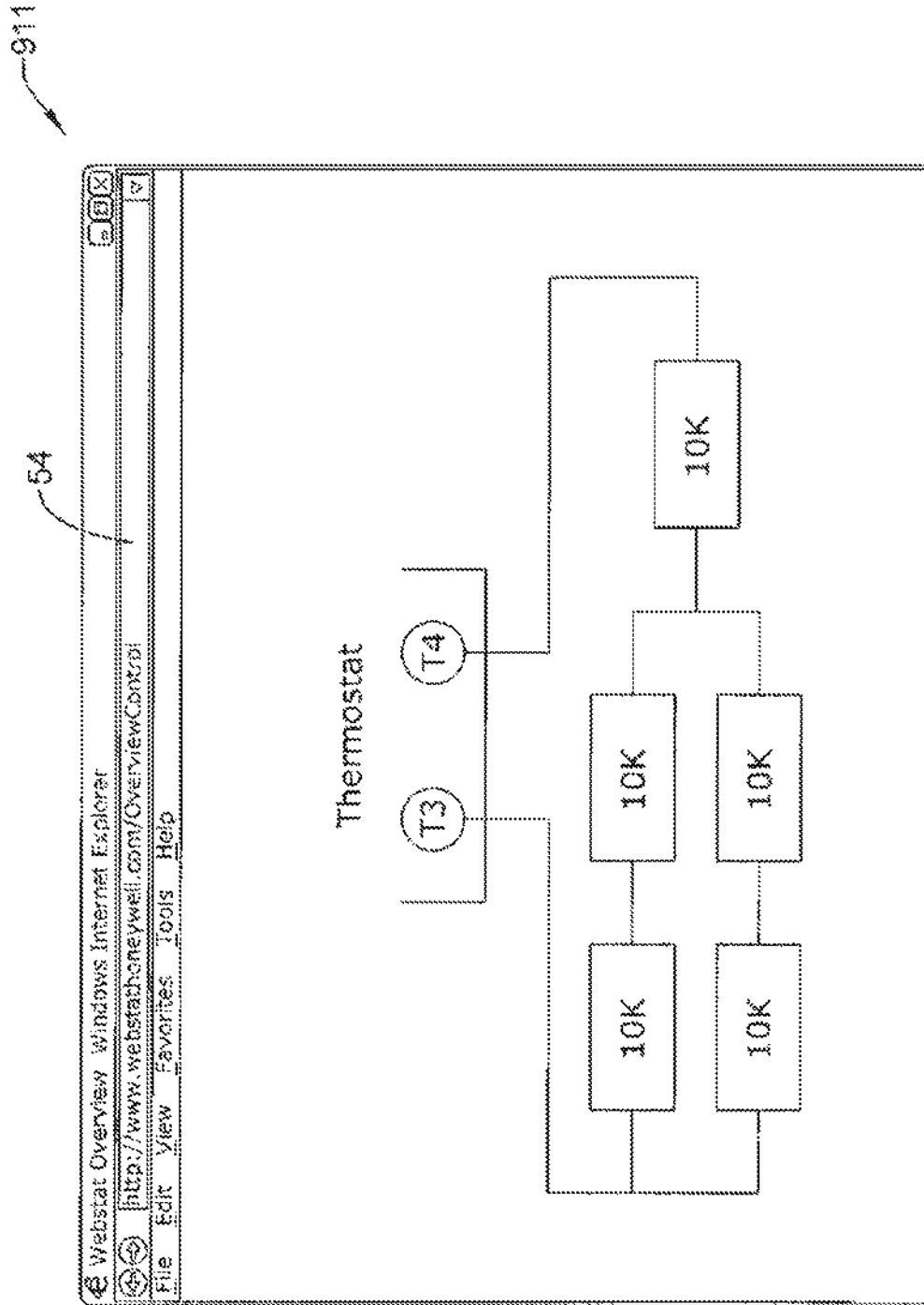
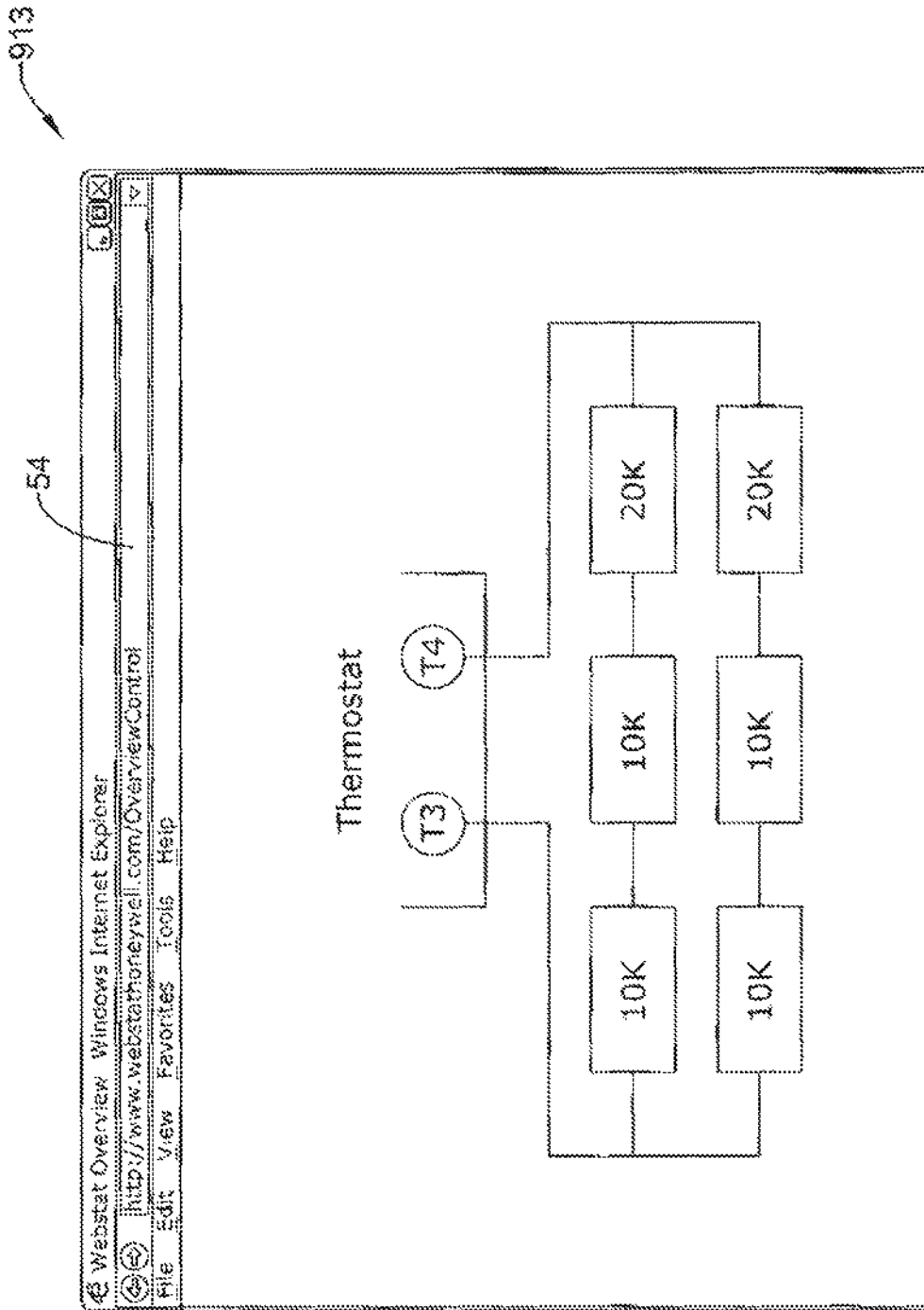
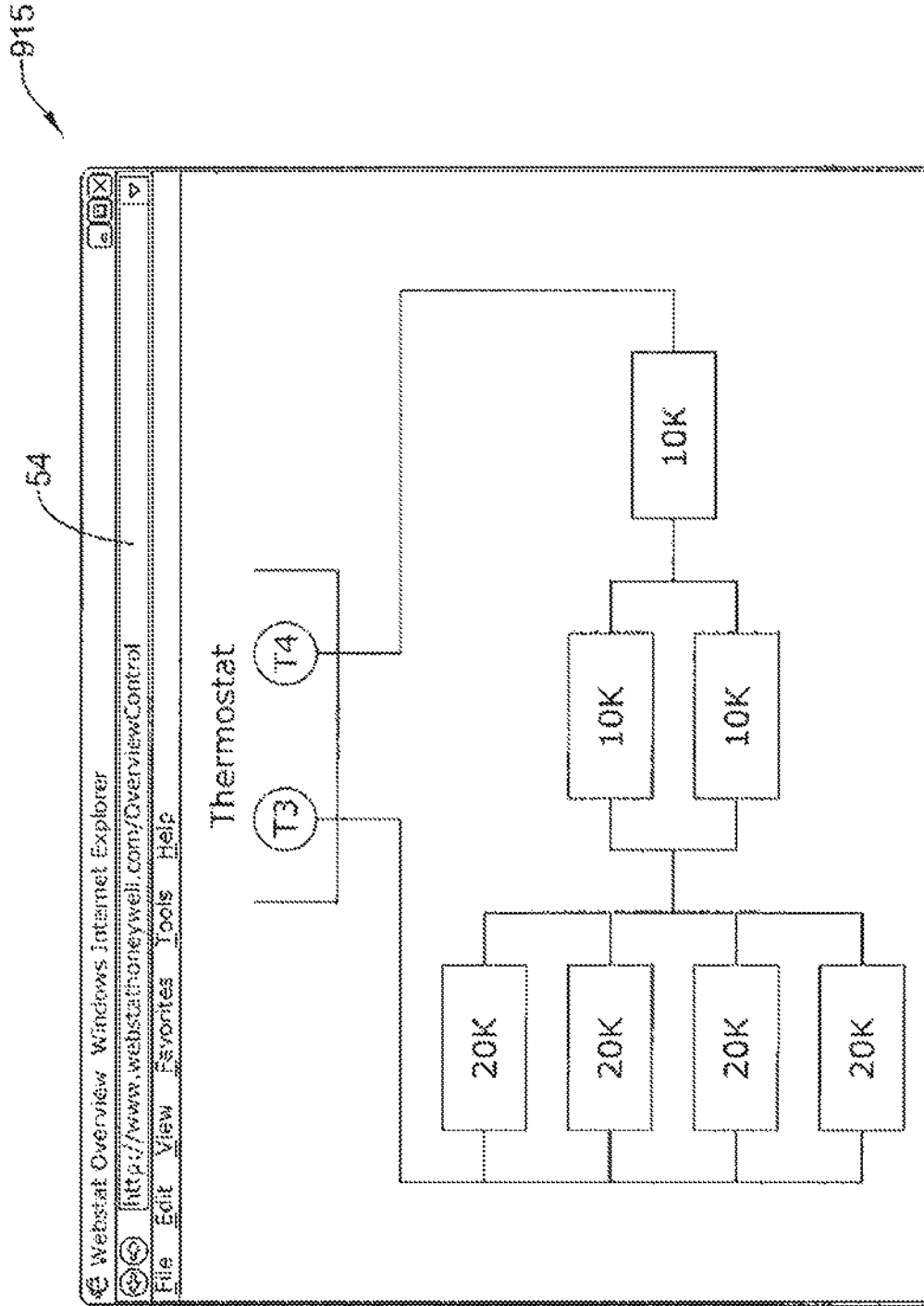
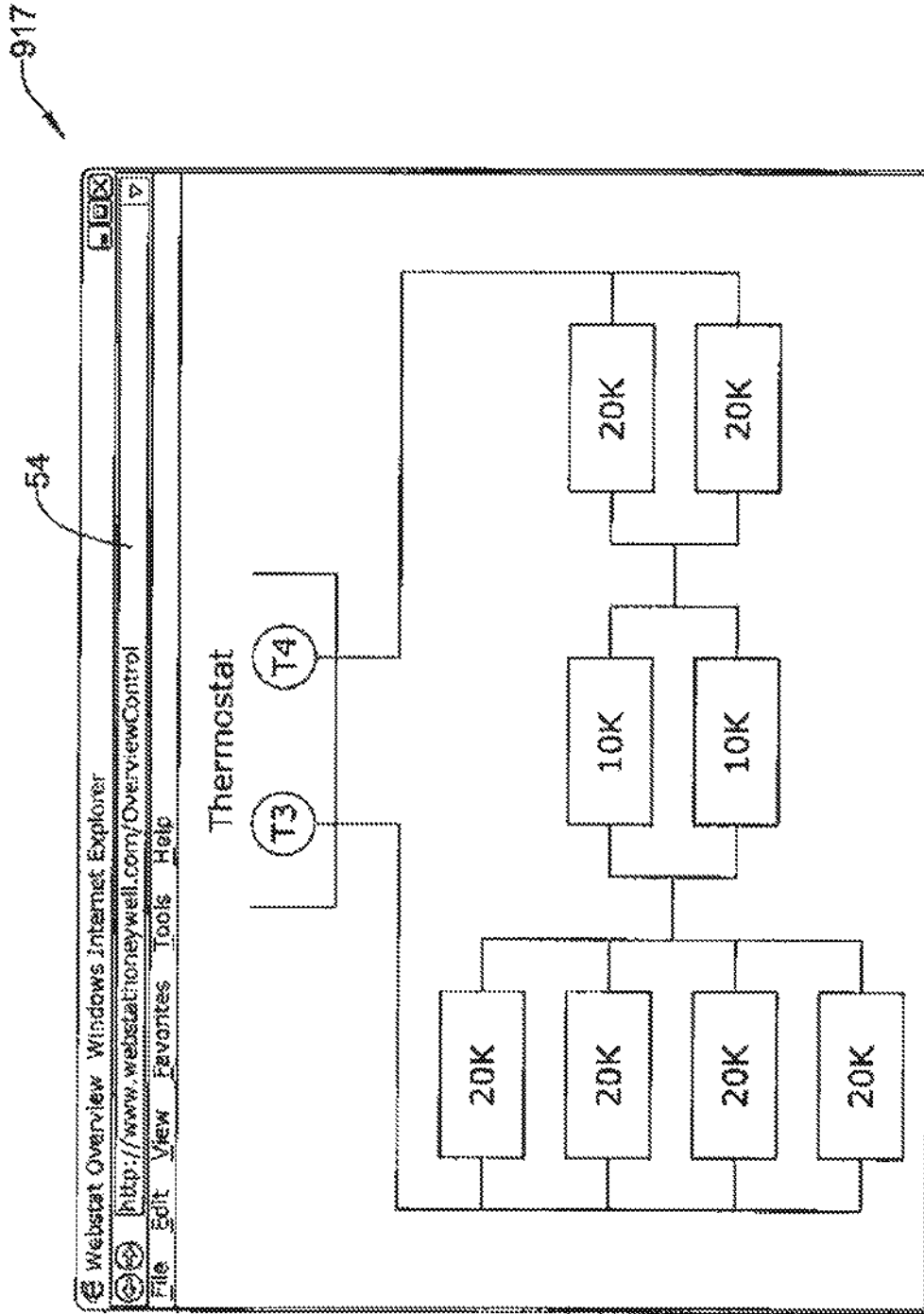


Figure 9Q

*Figure 9R*

*Figure 9S*

*Figure 9I*

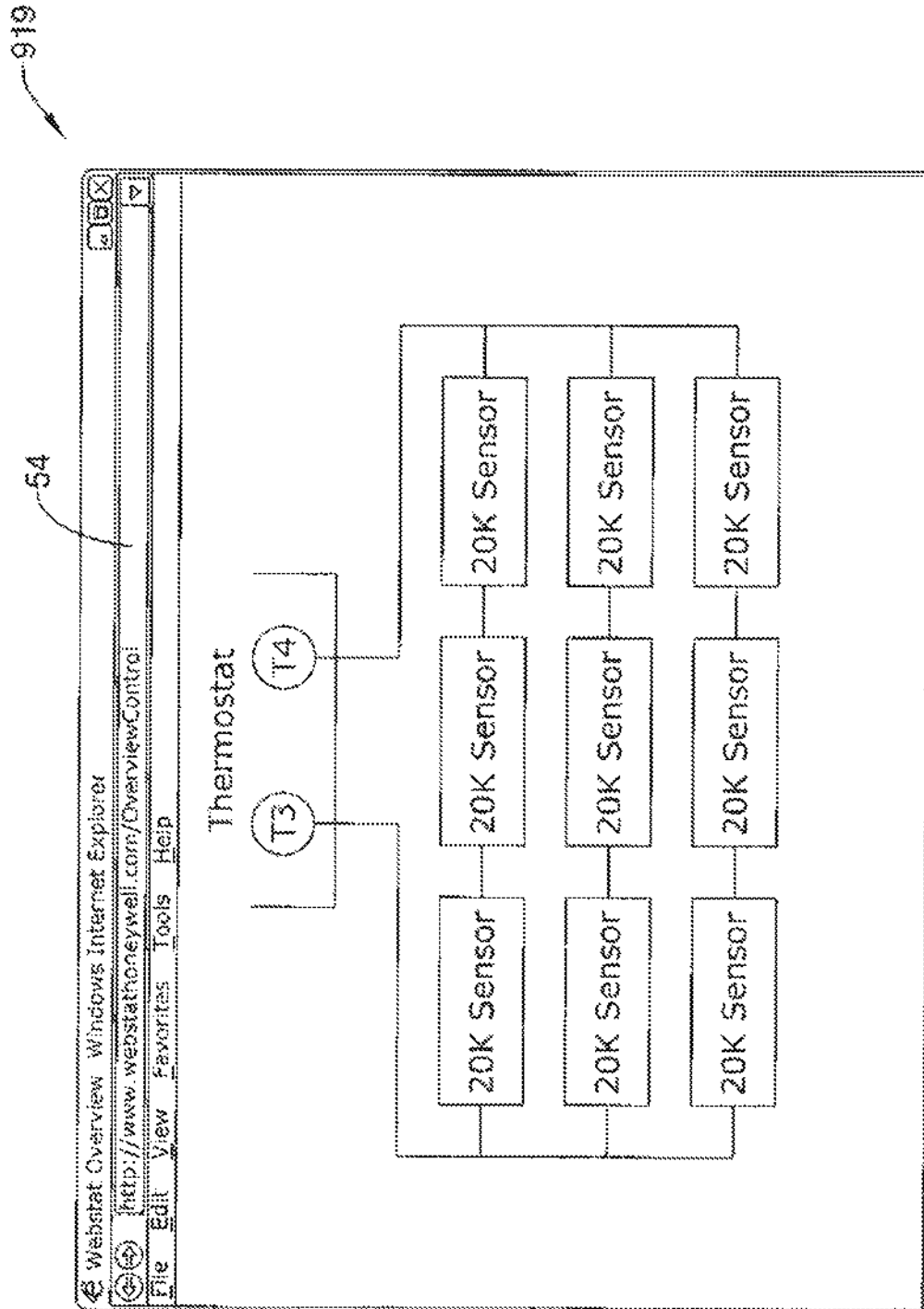


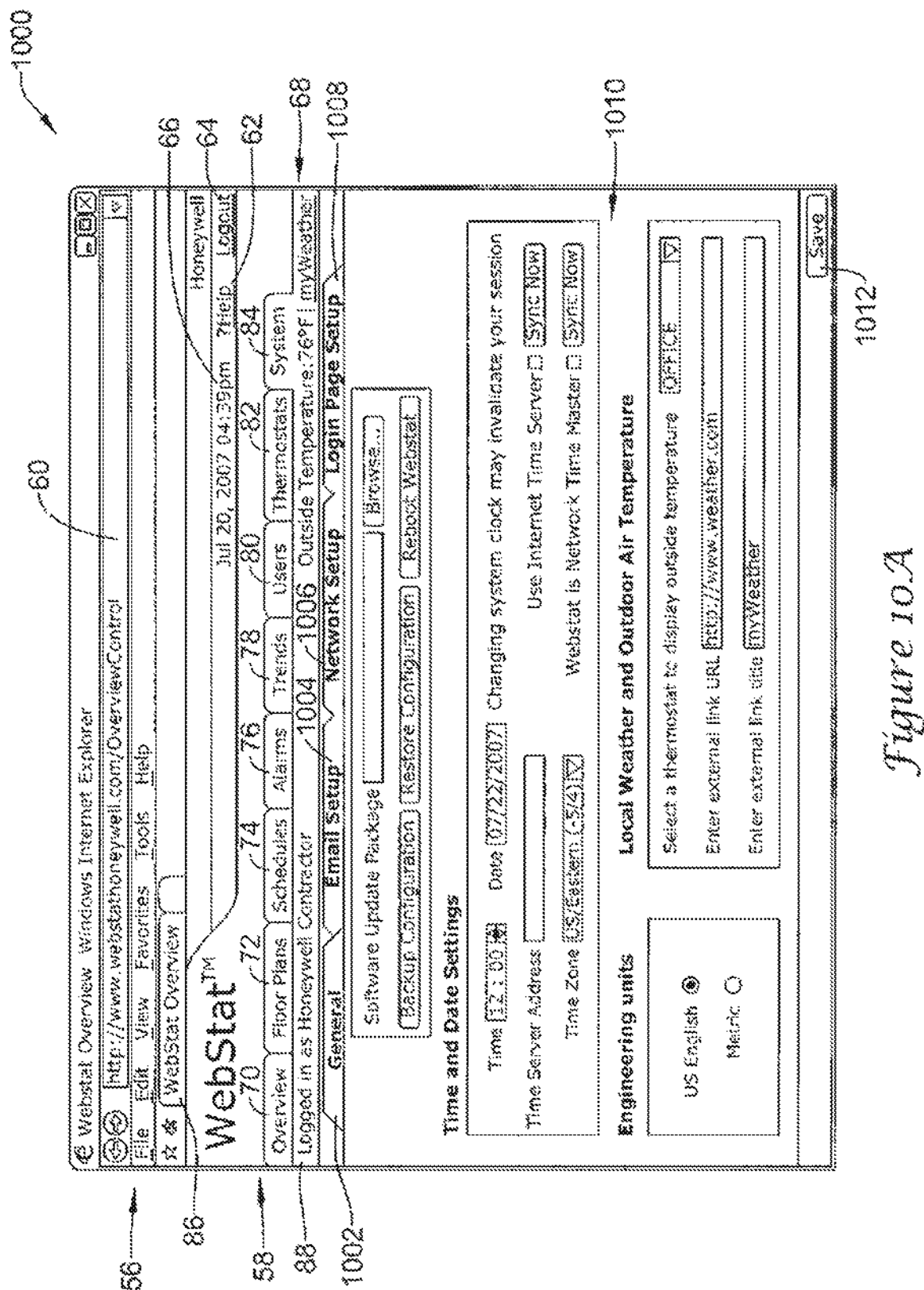
Figure 91

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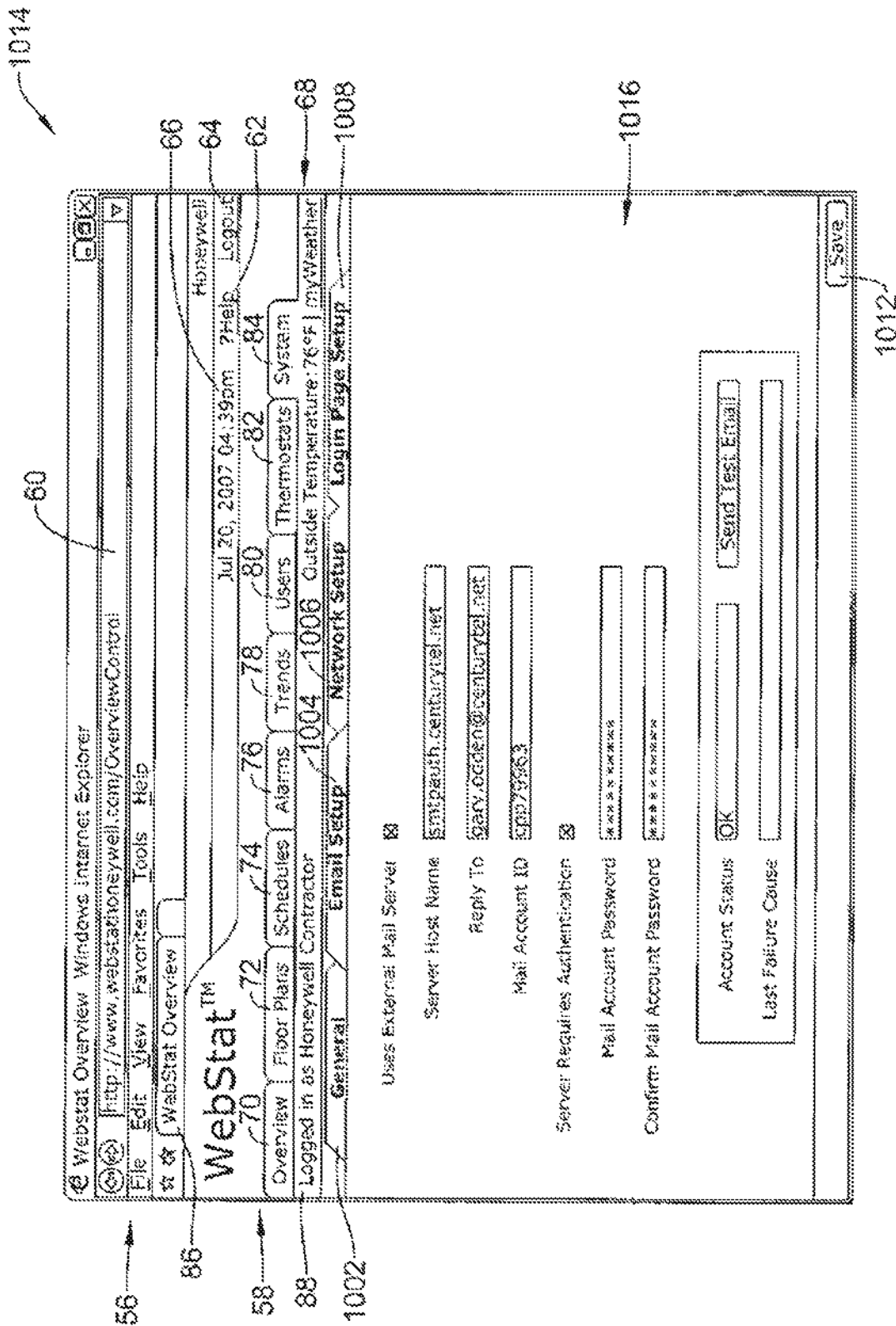


Figure 10B

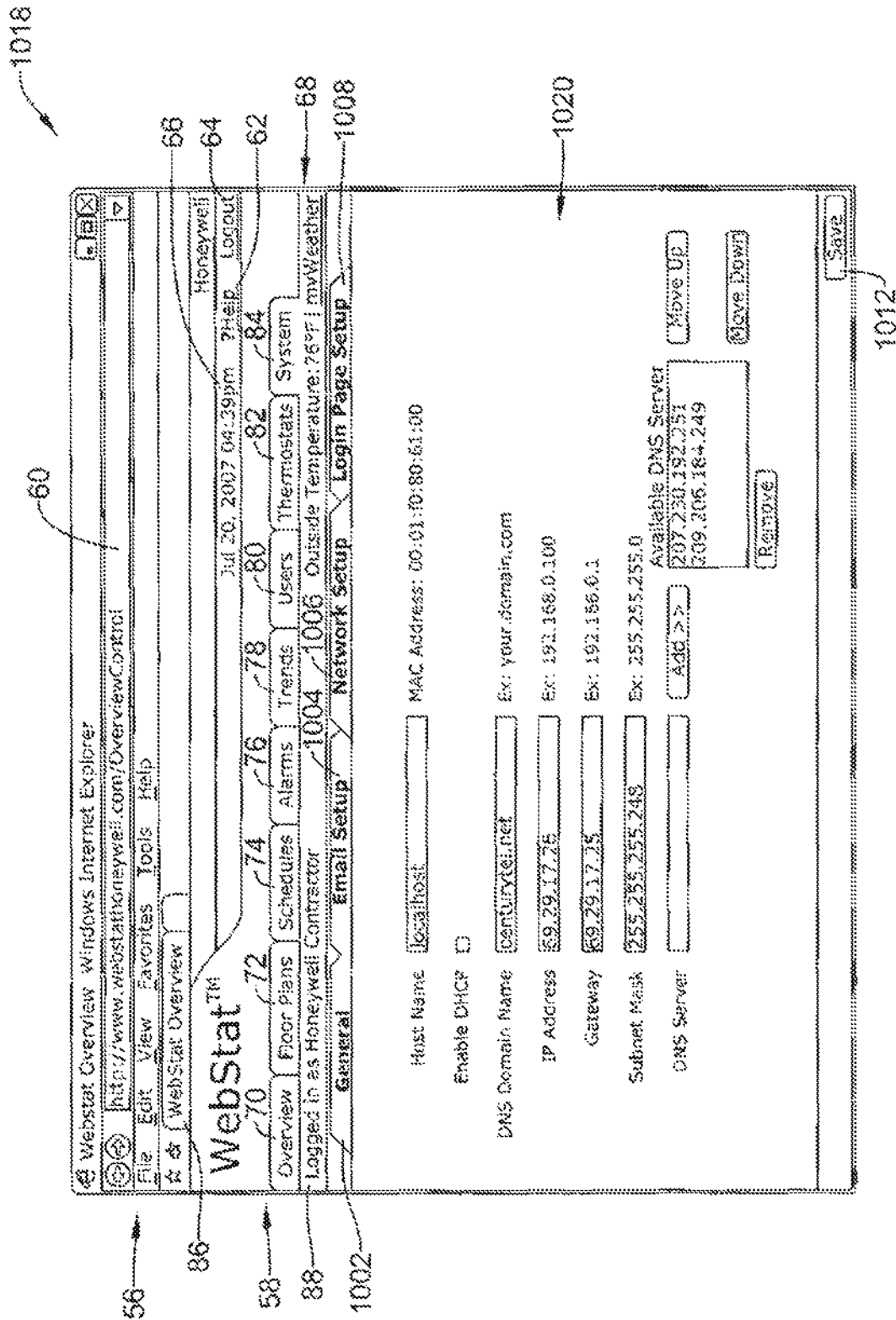


Figure 10C

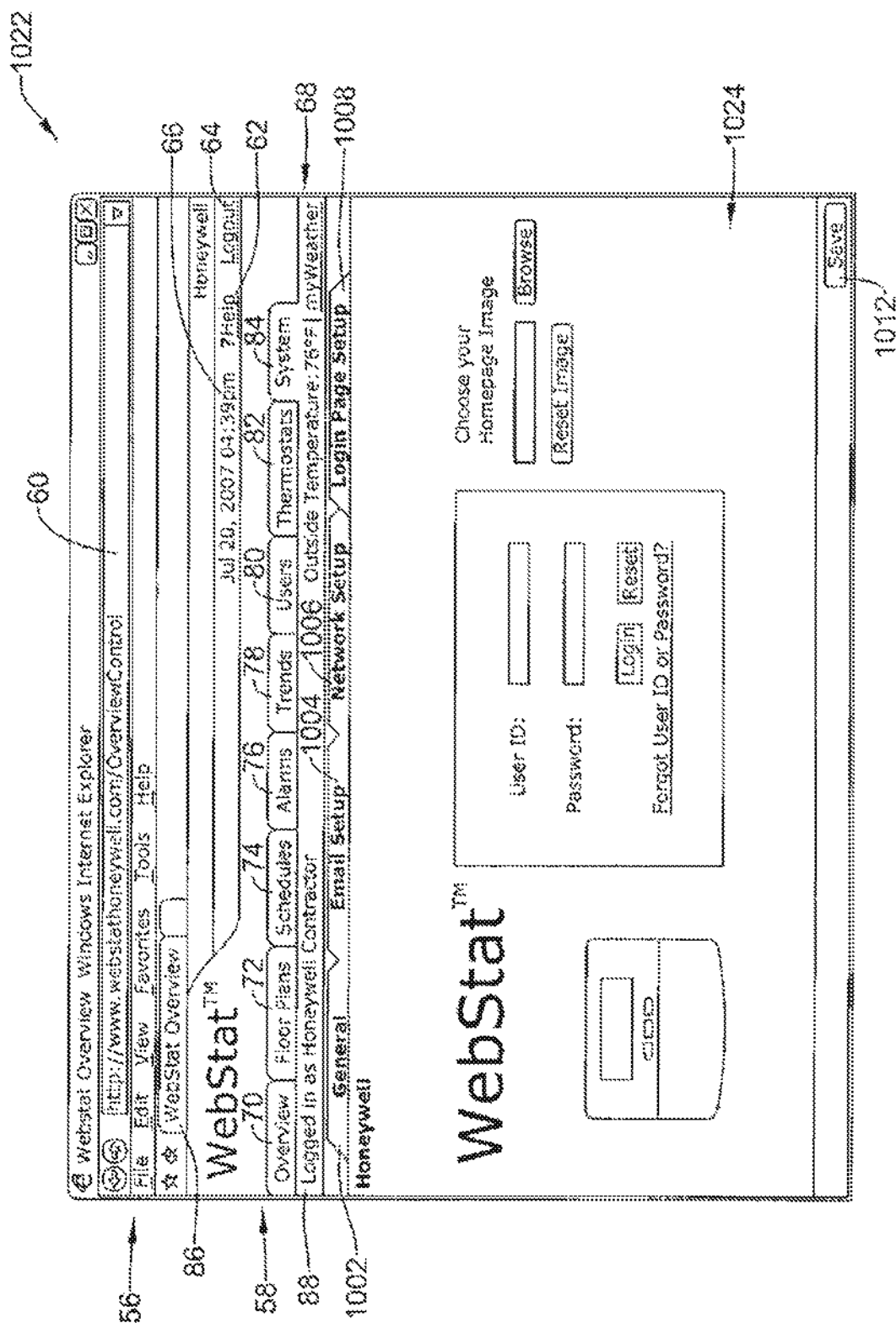
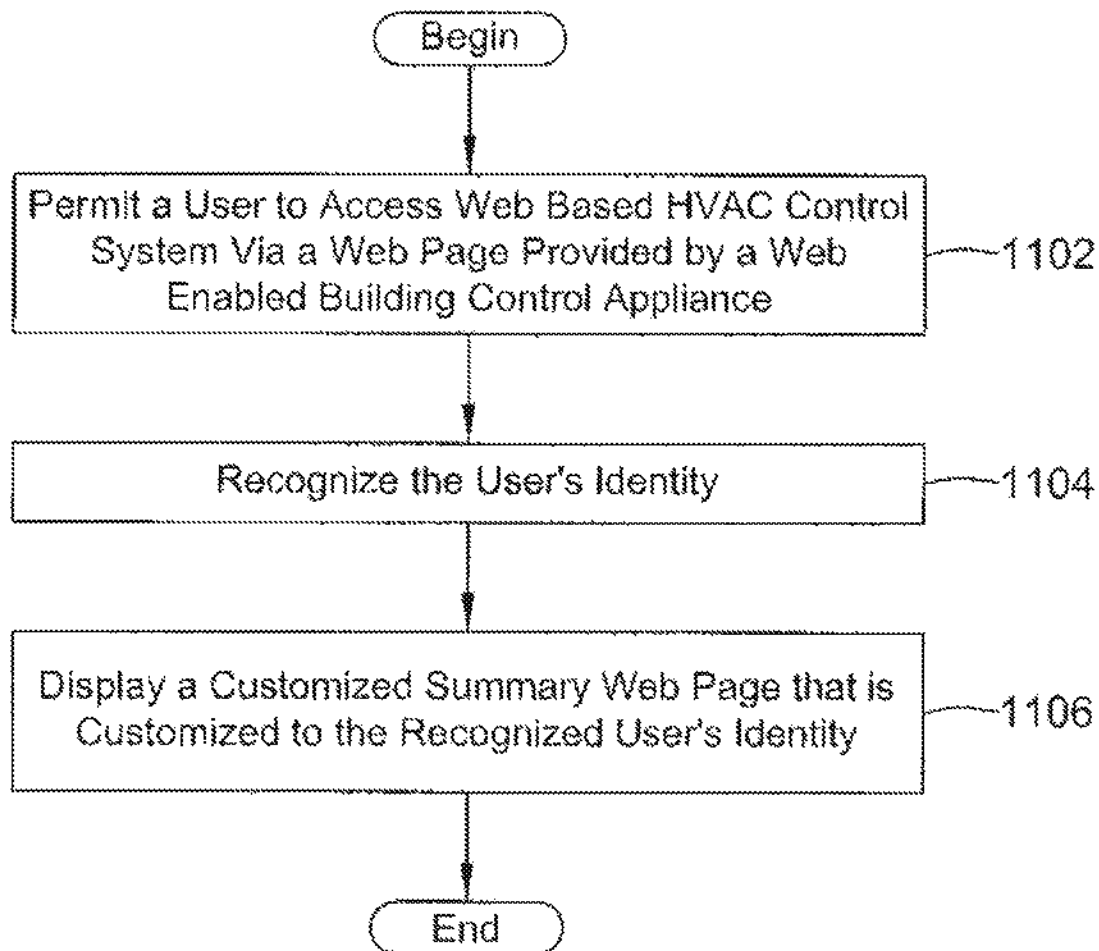
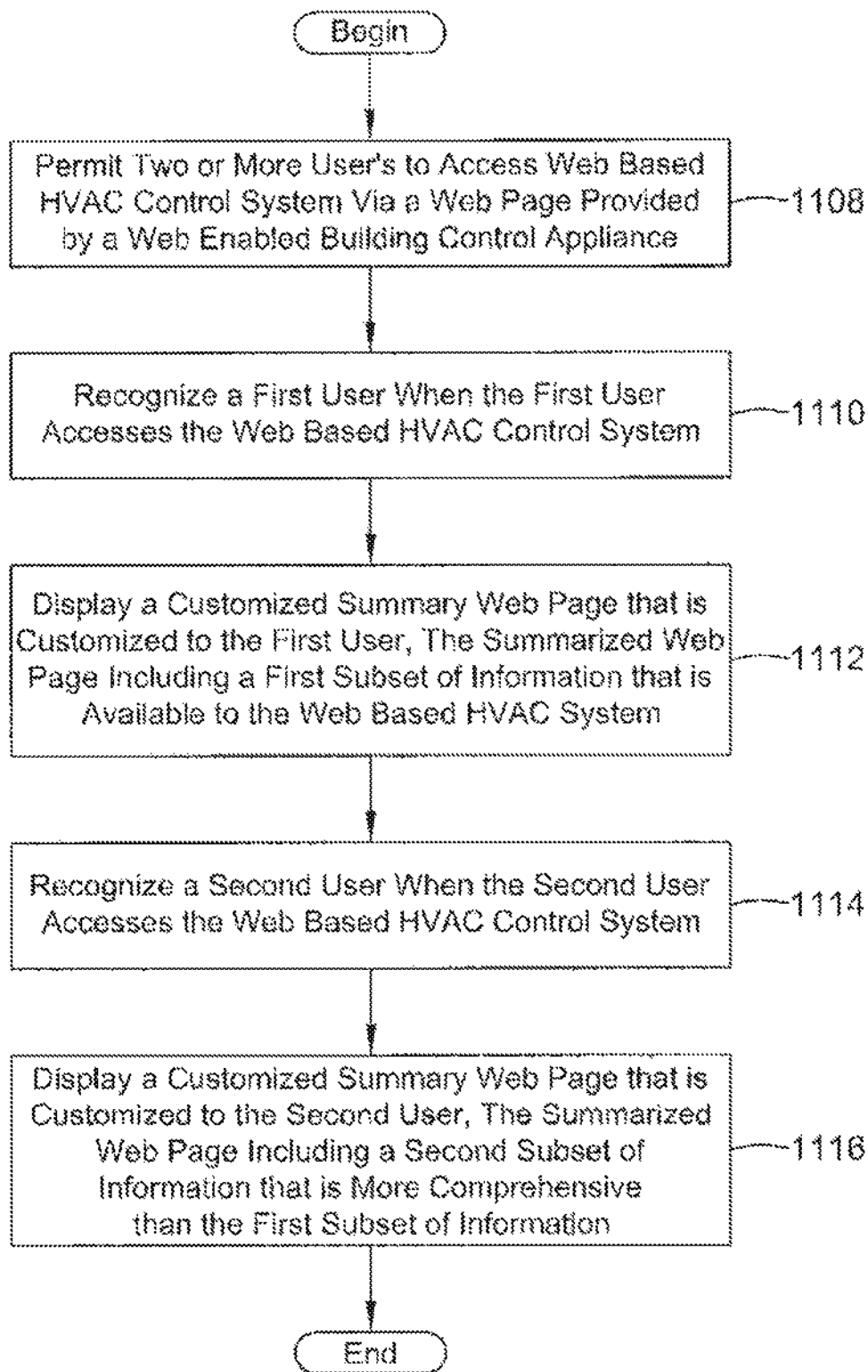


Figure 10D

*Figure 11A*

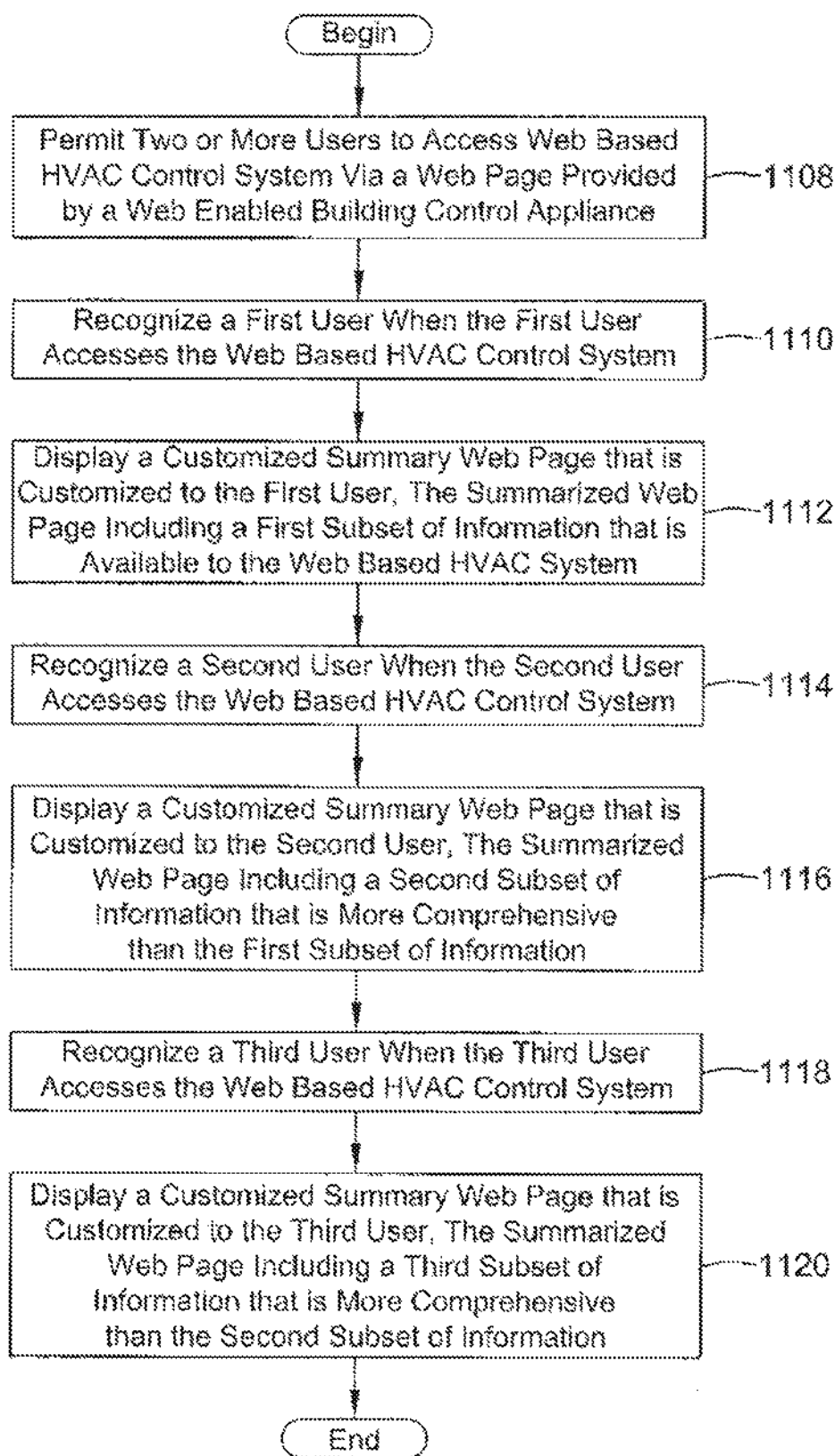
*Figure 11B*

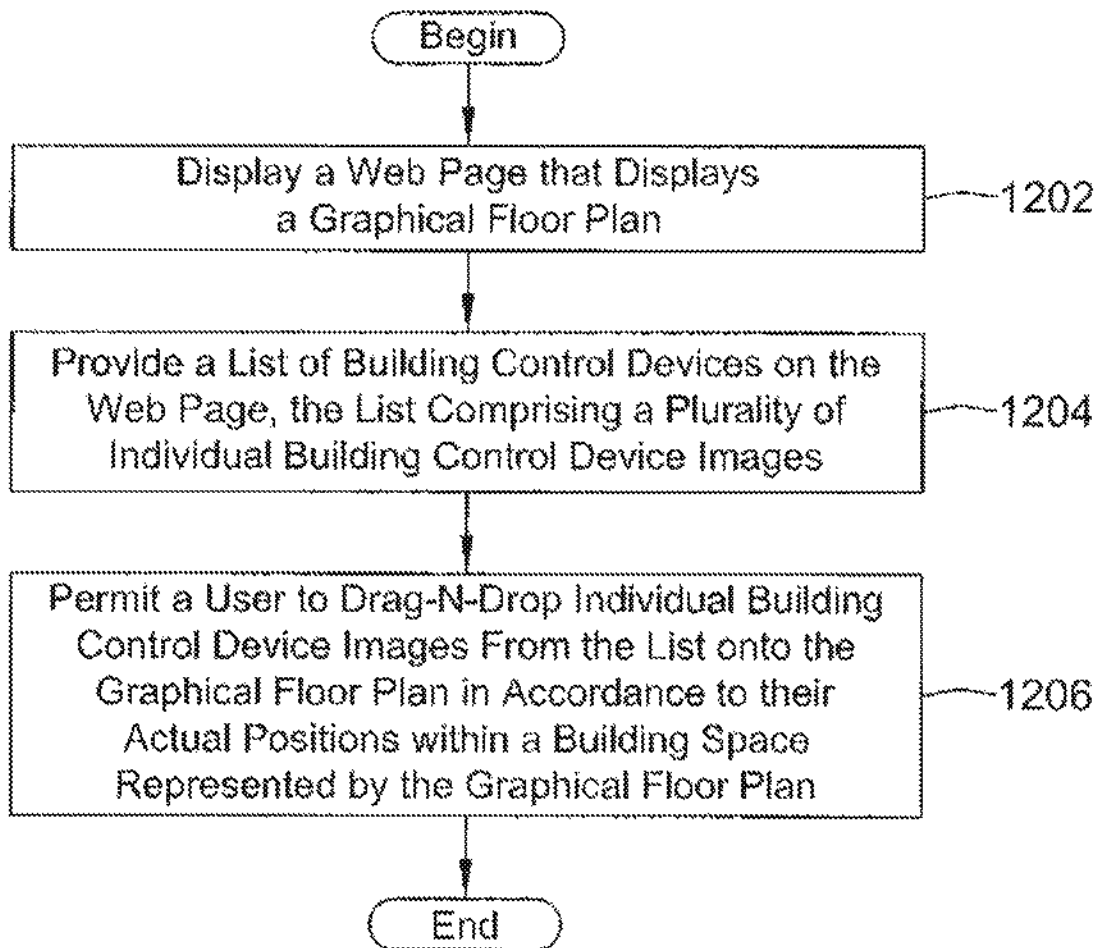
U.S. Patent

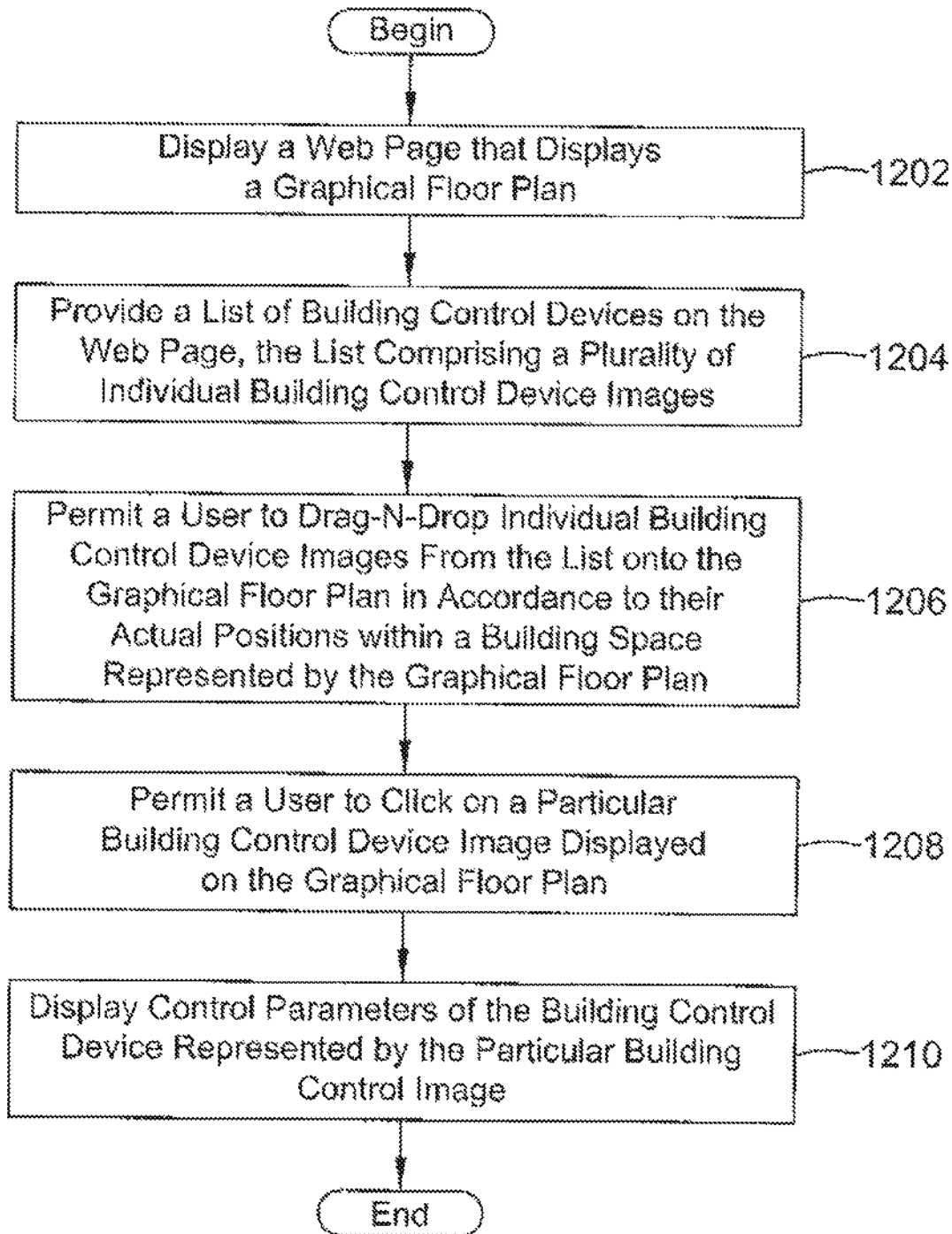
Aug. 7, 2012

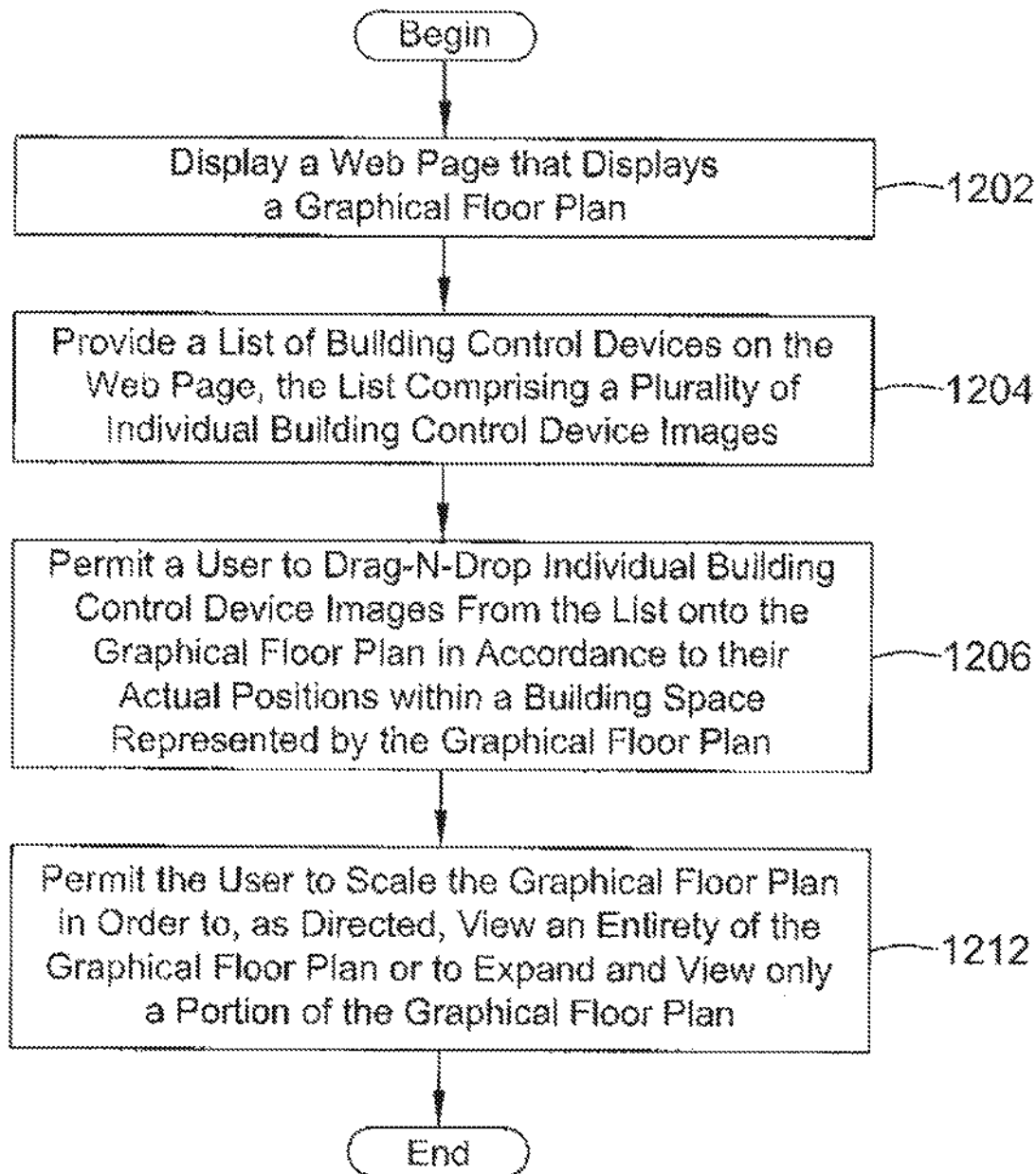
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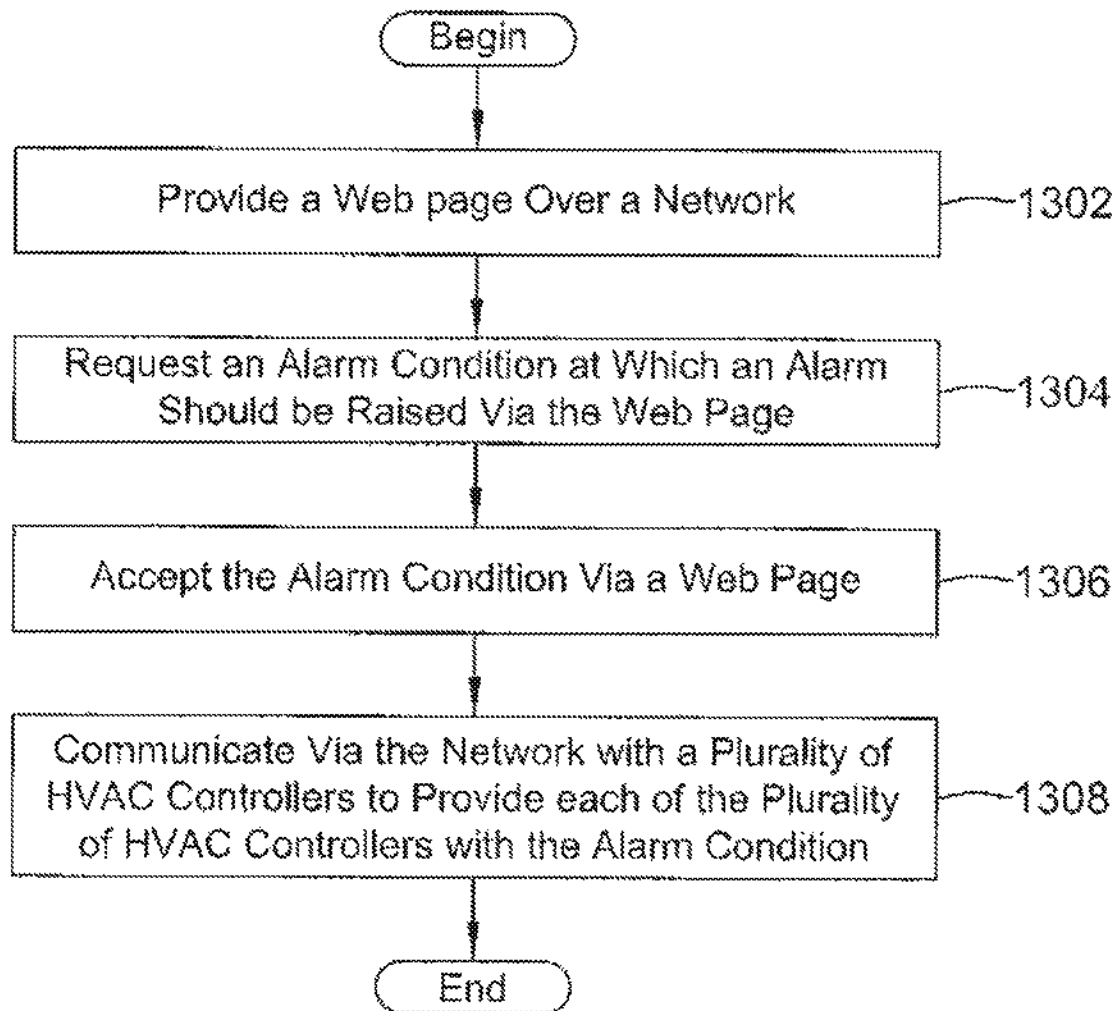
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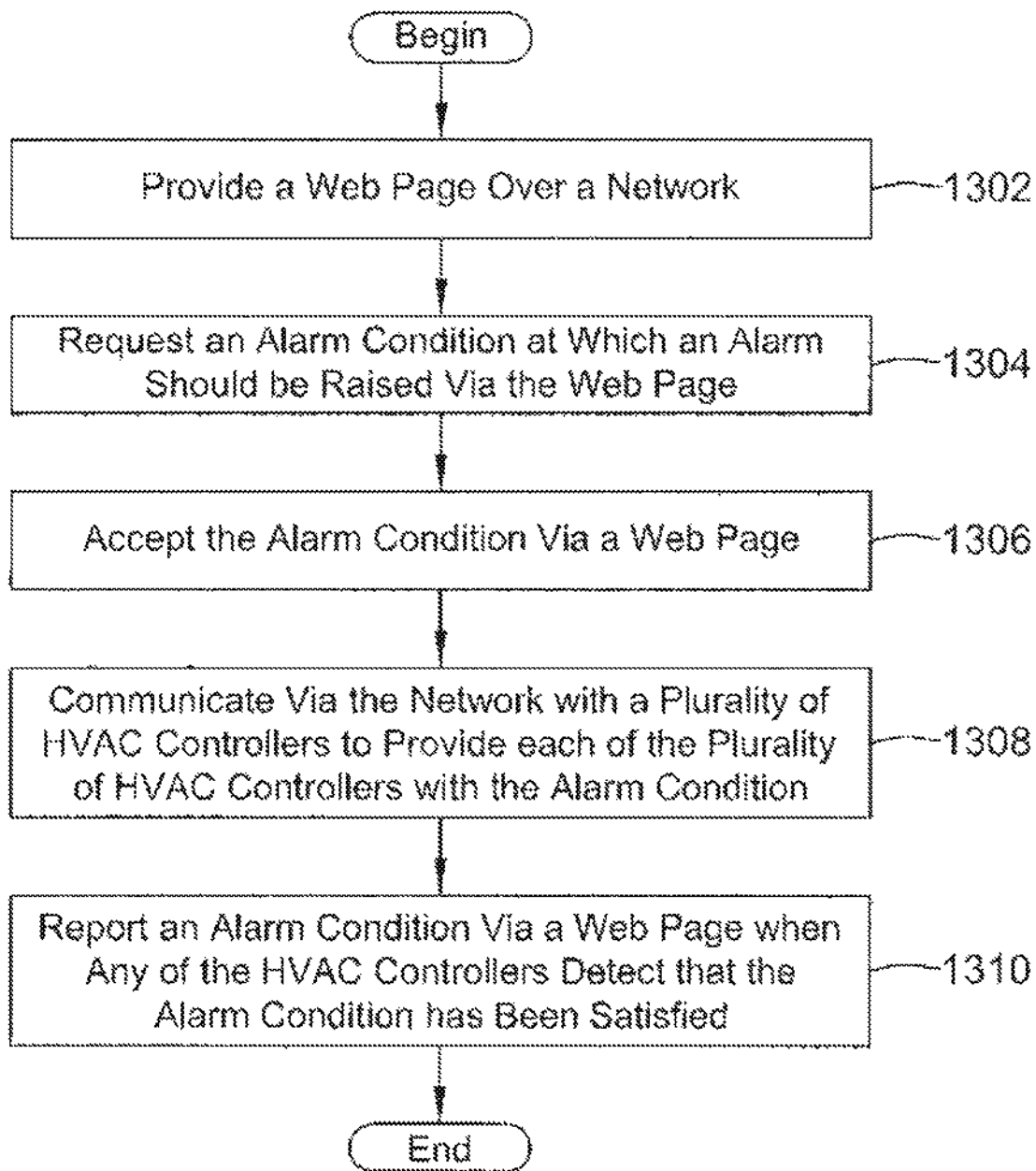
*Figure 11C*

*Figure 12A*

*Figure 12B*

*Figure 12C*

*Figure 13A*

*Figure 13B*

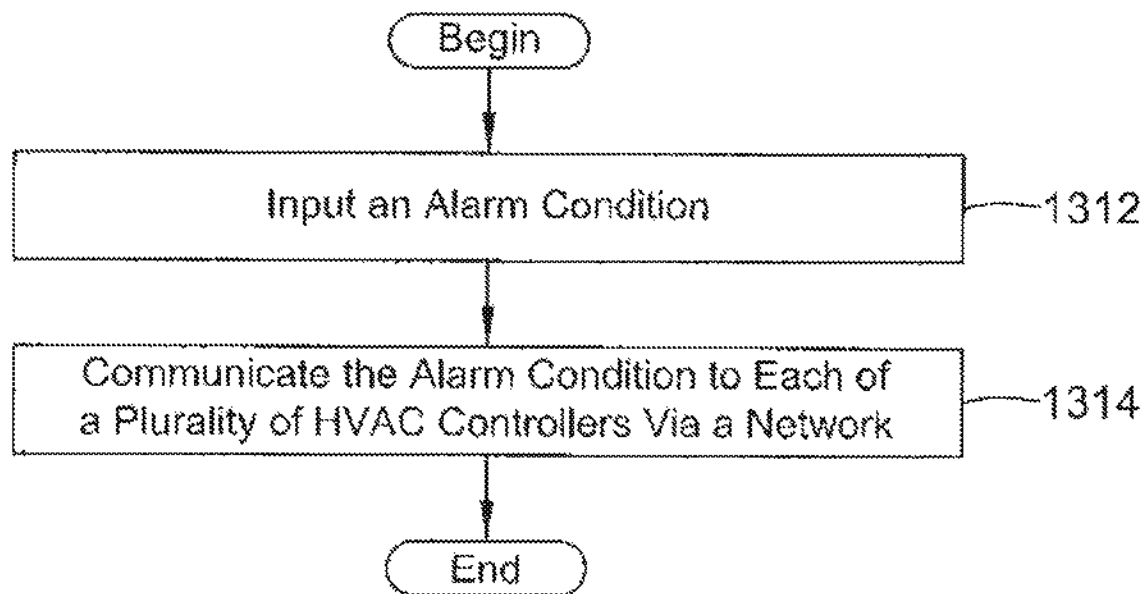
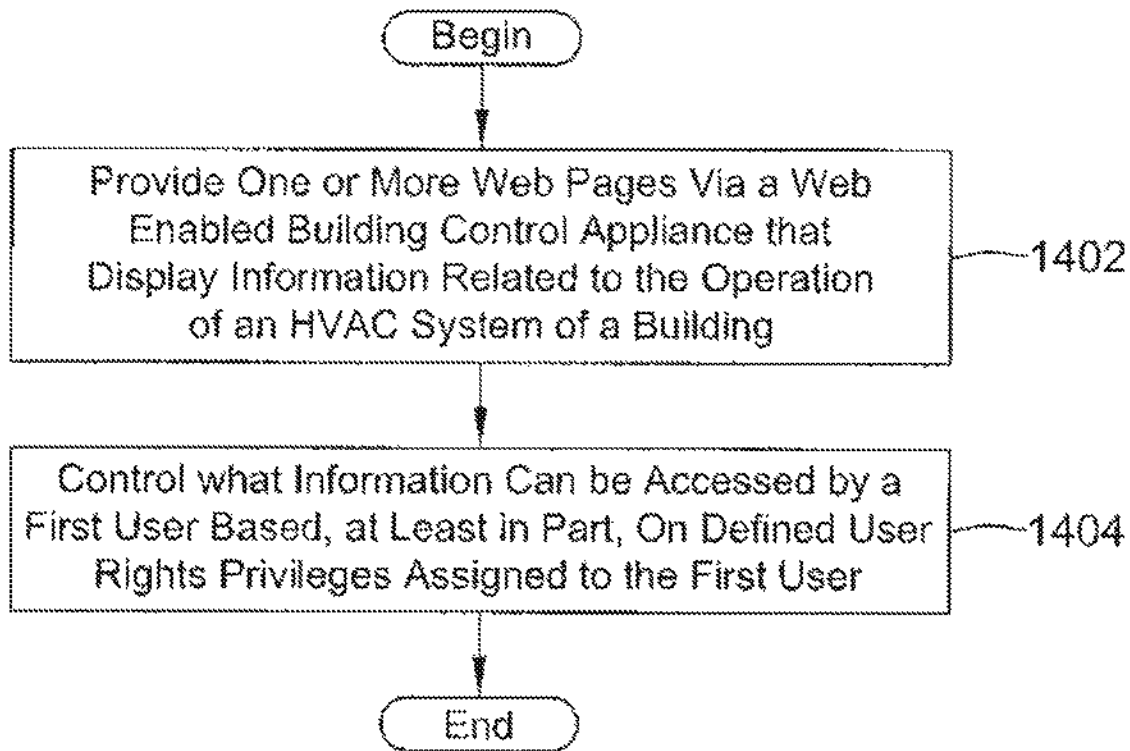
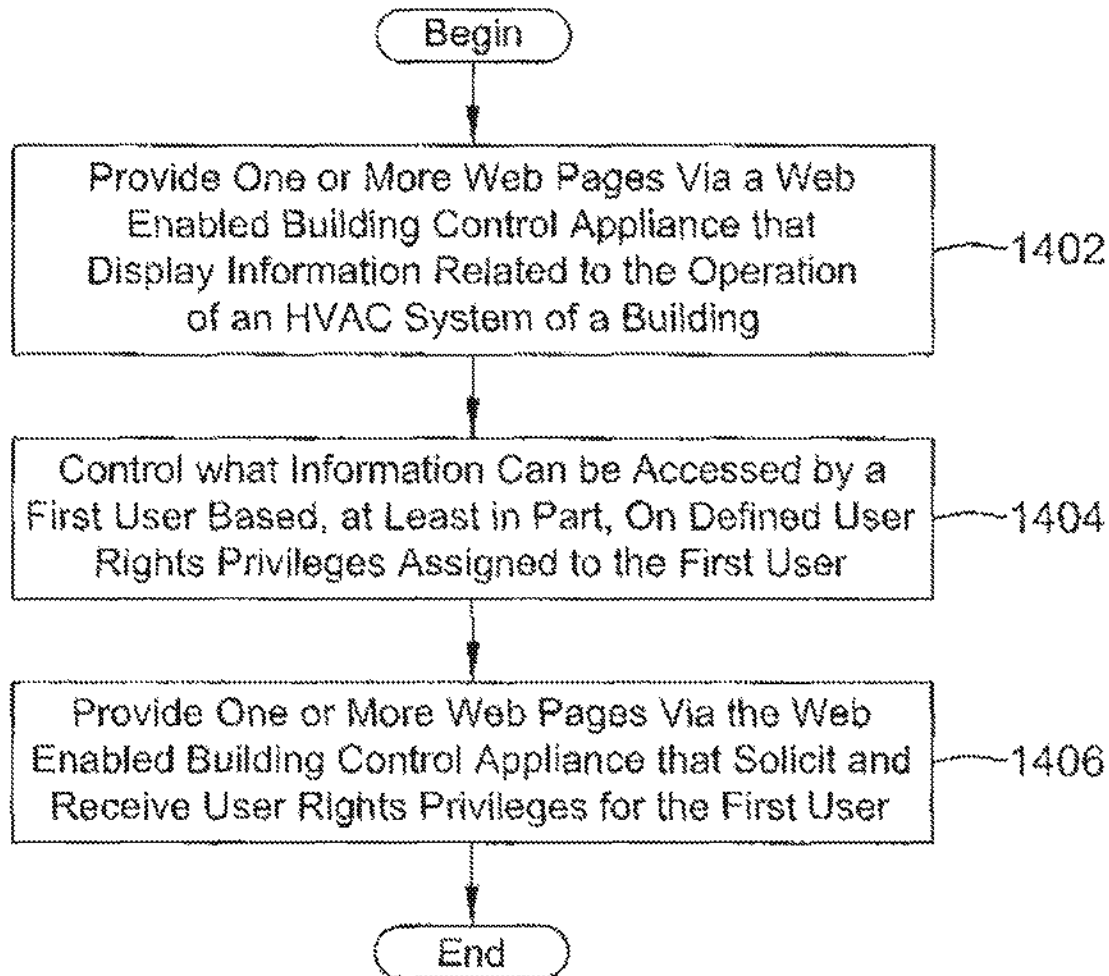
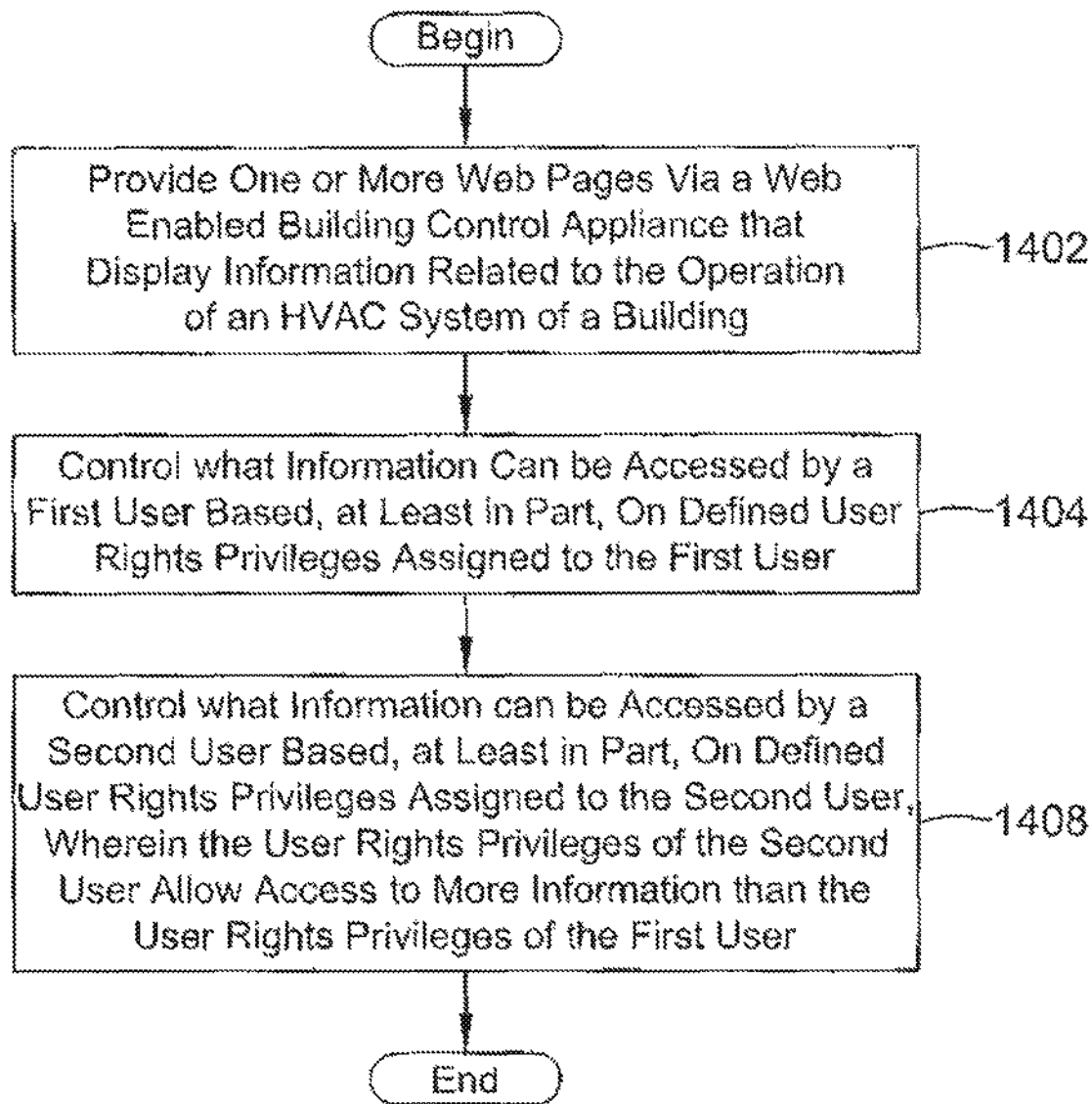
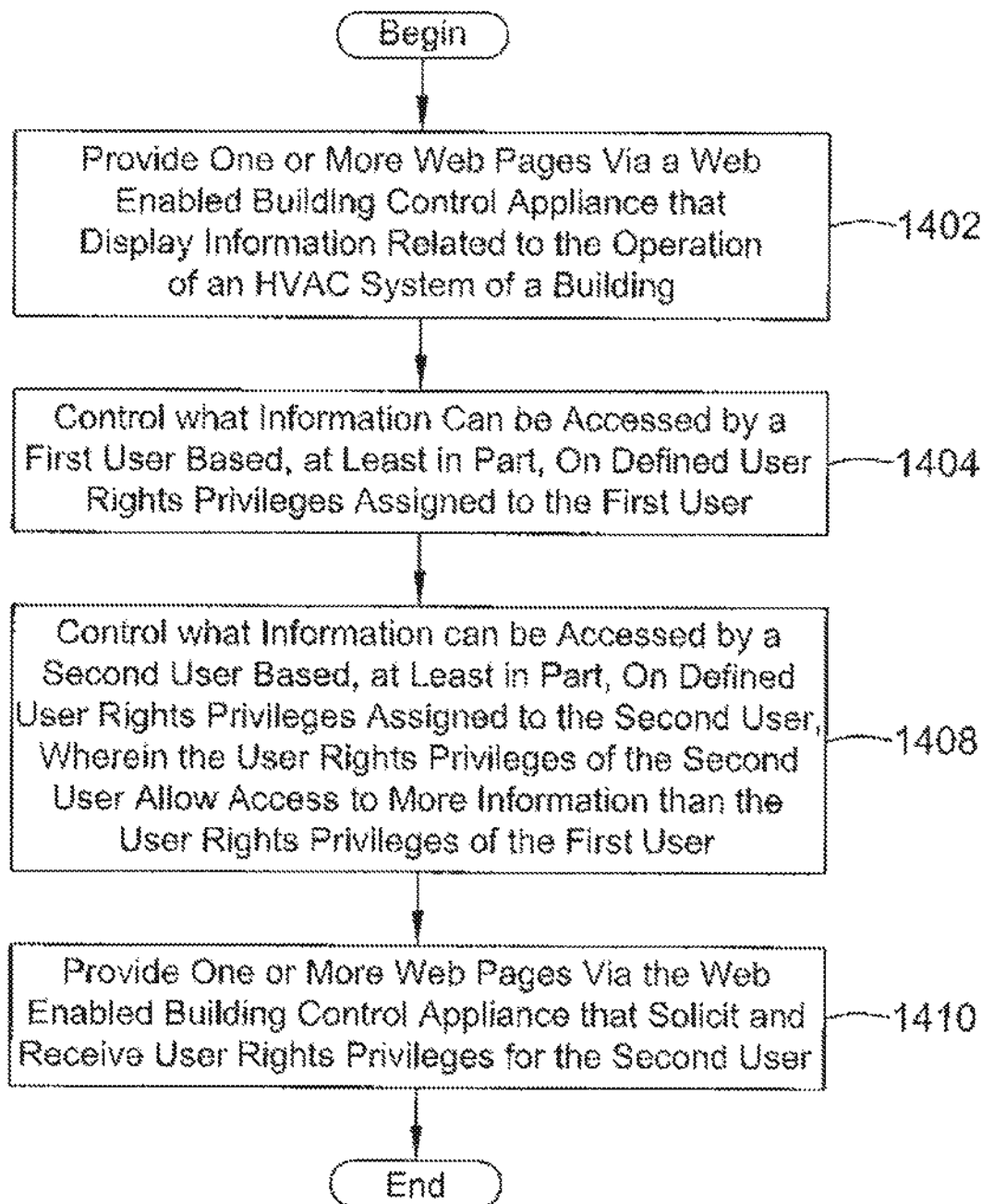


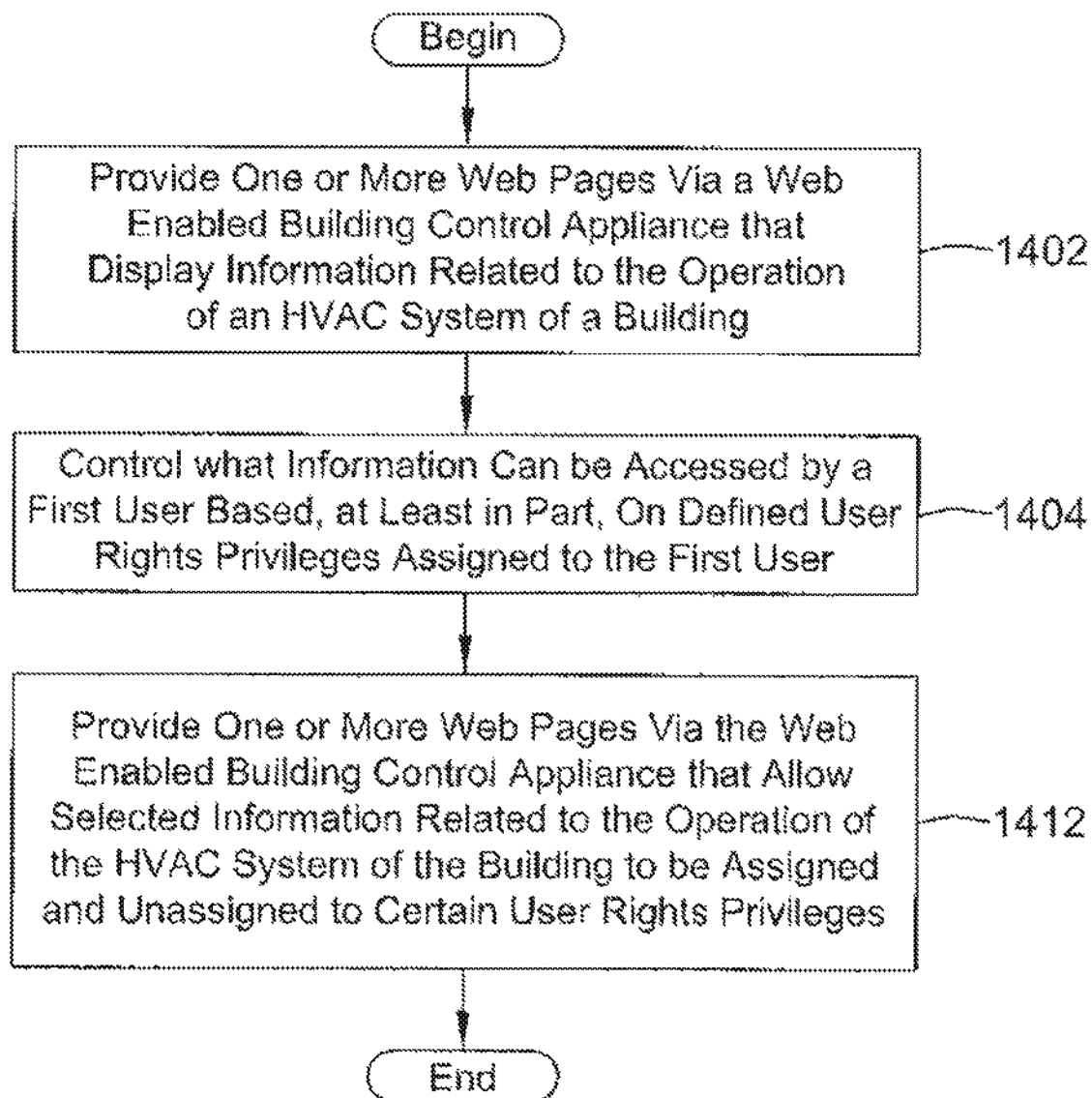
Figure 13C

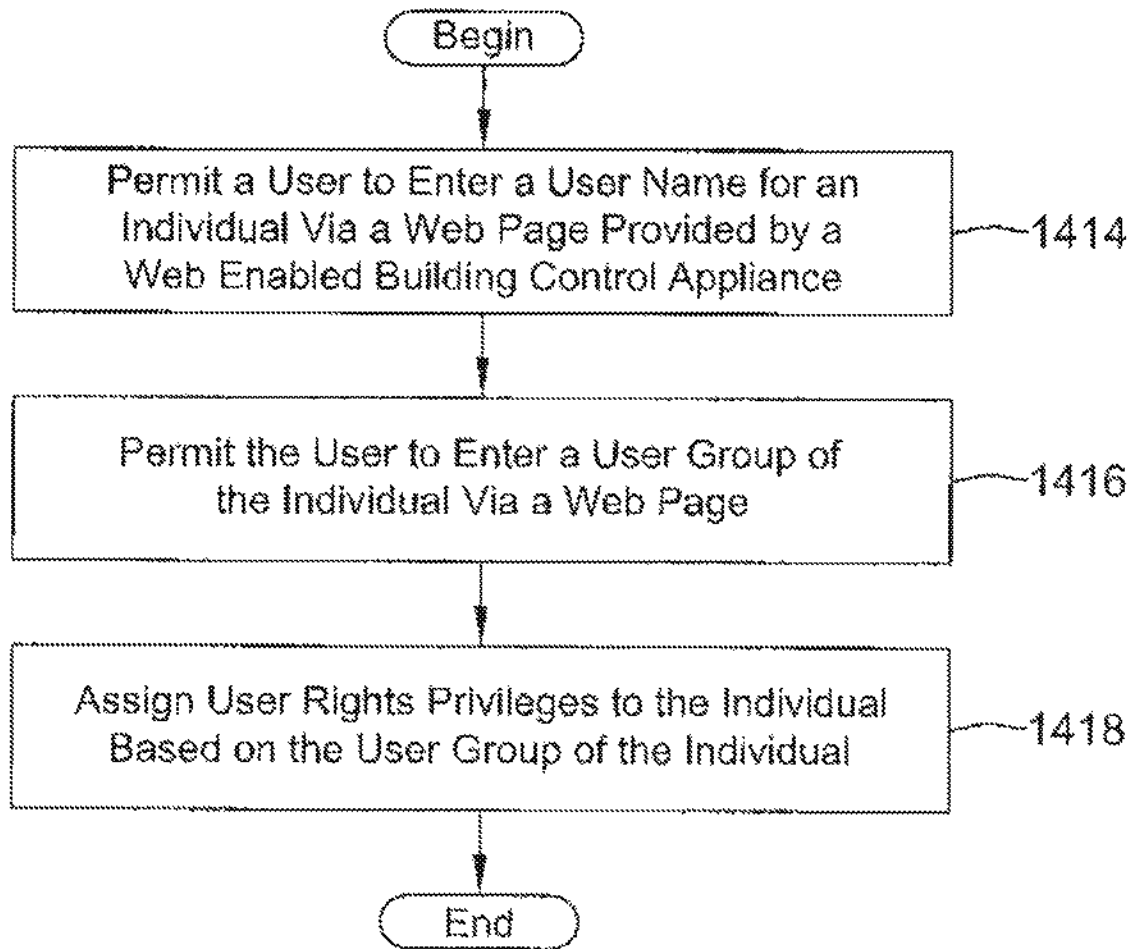
*Figure 14A*

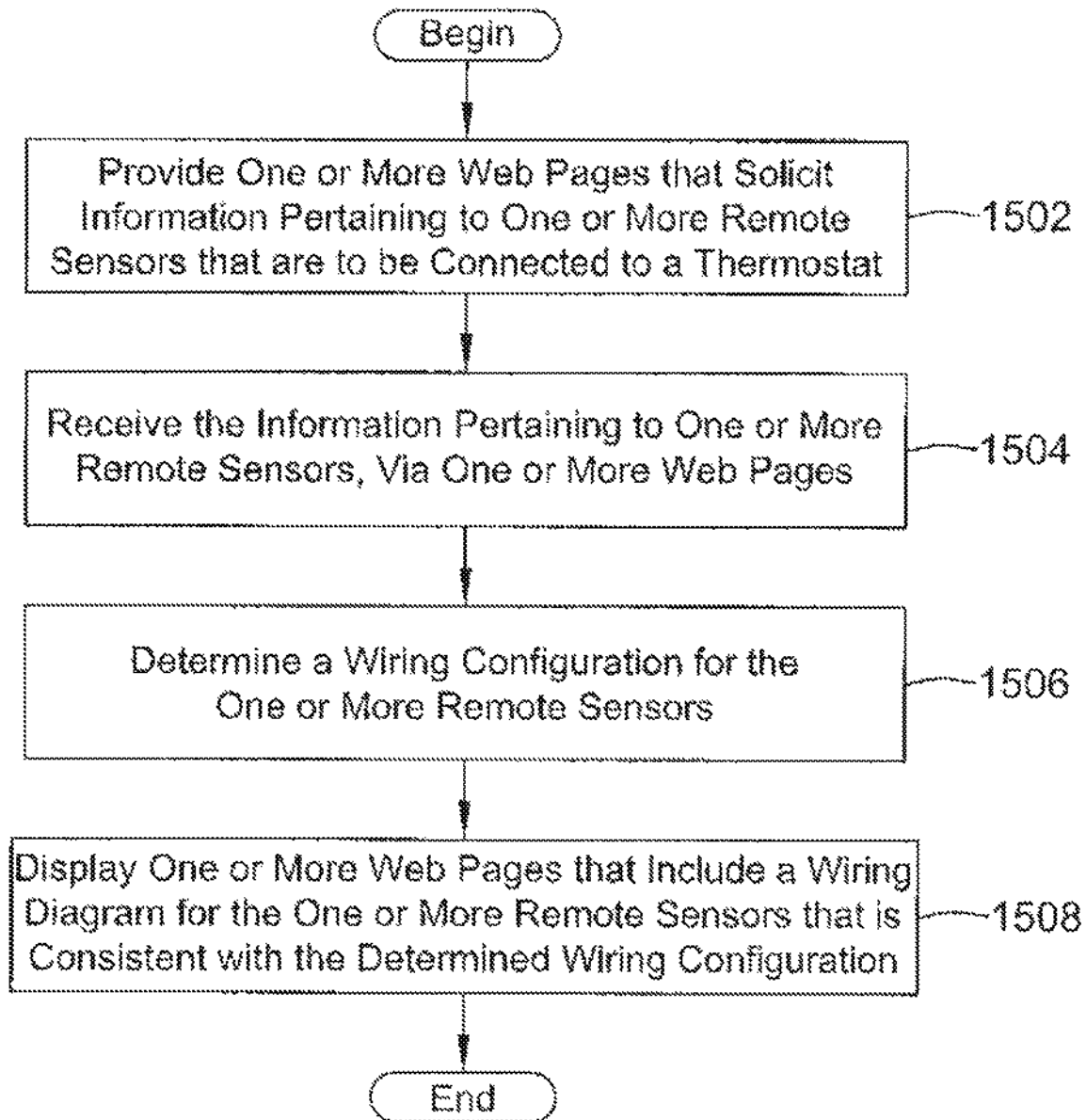
*Figure 14B*

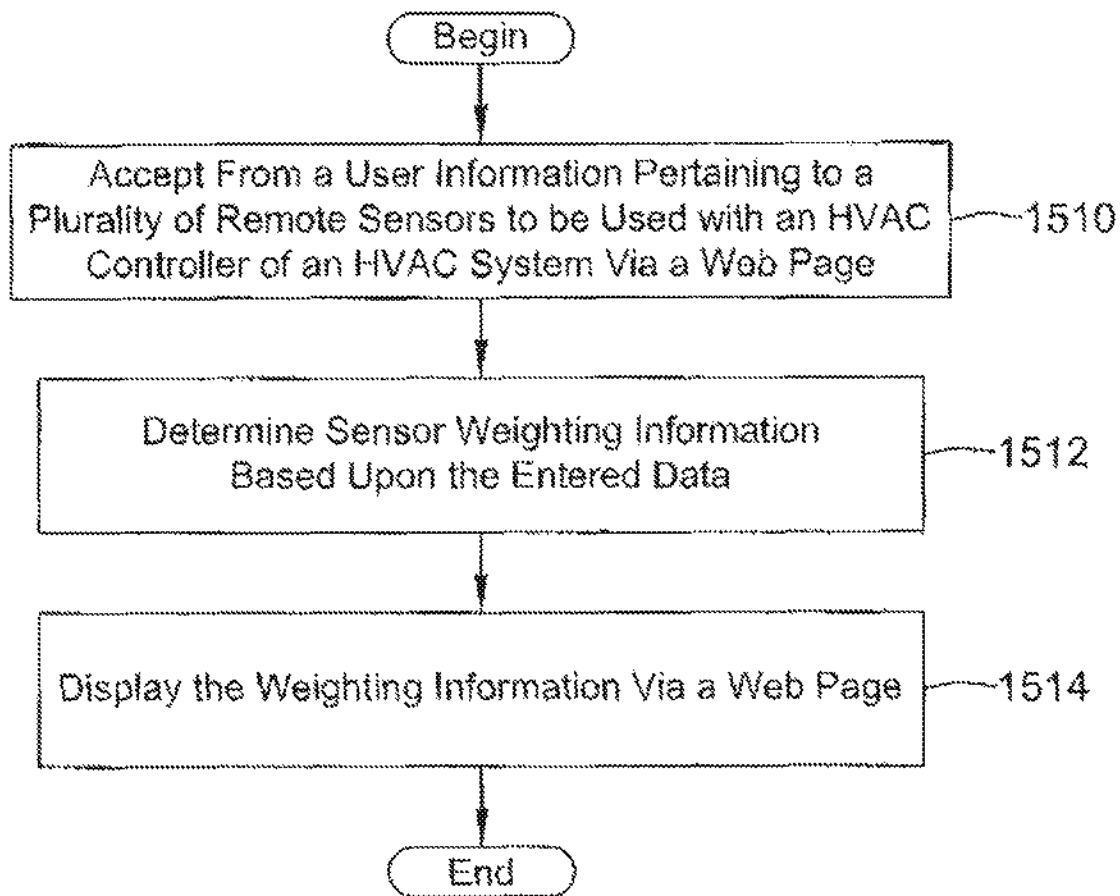
*Figure 14C*

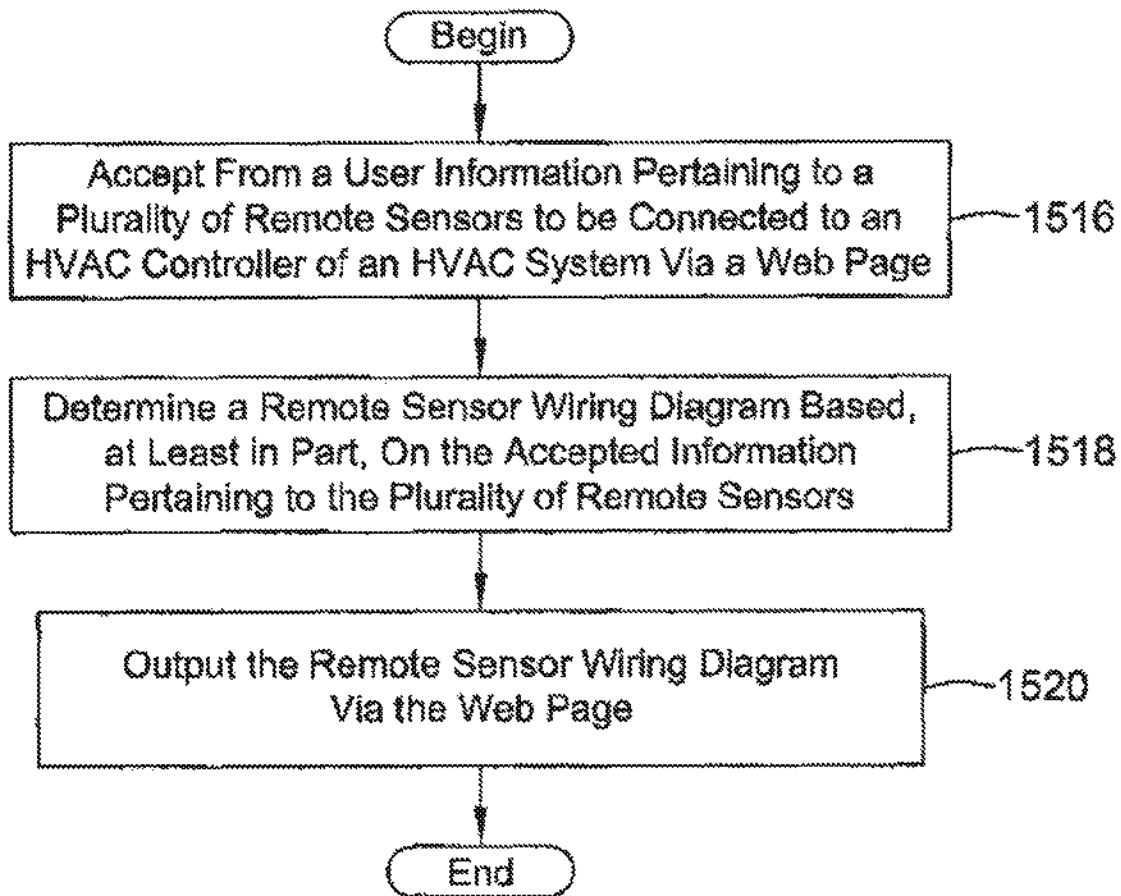
*Figure 14D*

*Figure 14E*

*Figure 14F*

*Figure 15A*

*Figure 15B*

*Figure 15C*

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REMOTE HVAC CONTROL WITH USER
PRIVILEGE SETUP

TECHNICAL FIELD

The present disclosure pertains generally to HVAC systems and more particularly to HVAC control systems that accommodate and/or facilitate control from a remote location.

BACKGROUND

HVAC systems are present in a wide range of residential and commercial buildings. In residential buildings such as houses and townhouses, the HVAC equipment such as heating, cooling and ventilating equipment may be controlled by a single thermostat. Some houses may have zoned HVAC and thus may have several thermostats, with each thermostat controlling a particular zone. In larger residential buildings such as large condominium buildings and/or apartment buildings, the HVAC equipment may be either localized or centralized, and may be controlled by one or more thermostats within each space (apartment or the like).

A wide variety of commercial buildings are known. Some commercial buildings such as small to medium retail centers including strip malls, small to medium office buildings and the like may be heated, cooled and/or ventilated by a number of HVAC units. In some cases, the HVAC units are rooftop units, but this is not required. Some buildings may have a significant number of HVAC units and a significant number of corresponding HVAC controllers such as thermostats. Installation, operation and monitoring of such HVAC systems can be complicated. Thus, a need remains for HVAC control systems that are suitable for a variety of different applications, that are easy to use and that are cost-effective.

SUMMARY

The present disclosure pertains to HVAC control systems that accommodate and/or facilitate control from a remote location. In some instances, an HVAC control system may include a web enabled building control appliance having a controller and a first port that is coupled to the controller and that is adapted to communicate over a first network. The controller may implement a web server that is coupled to the first port for serving up one or more web pages on the first network via the first port. The controller may be coupled to a second port that is adapted to be coupled to and communicate with two or more communicating thermostats via a second network. The web server may provide one or more web pages via the first port that solicit and receive user rights privileges.

The above summary is not intended to describe each disclosed embodiment or every implementation of the present invention. The Figures and Detailed Description that follow more particularly exemplify these embodiments.

BRIEF DESCRIPTION OF THE FIGURES

The invention may be more completely understood in consideration of the following detailed description of various embodiments of the invention in connection with the accompanying drawings, in which:

FIG. 1 is a schematic view of an illustrative but non-limiting HVAC control system;

FIG. 2 is a schematic view of a portion of the HVAC control system of FIG. 1;

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FIGS. 3A-3F are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to an overview thereof;

FIGS. 4A-4E are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a floor plan functionality thereof;

FIGS. 5A-5D are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a scheduling functionality thereof;

FIGS. 6A-6C are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a batch alarm functionality thereof;

FIGS. 7A-7B are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a trend analysis and display functionality thereof;

FIGS. 8A-8J are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a users configuration functionality thereof;

FIGS. 9A-9U are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a thermostat configuration functionality thereof;

FIGS. 10A-10D are illustrative but non-limiting examples of web pages that may be generated by the HVAC control system of FIG. 1, pertaining to a system configuration functionality thereof;

FIGS. 11A-11C are flow diagrams providing illustrative but non-limiting examples of methods that may be carried out using the HVAC control system of FIG. 1;

FIGS. 12A-12C are flow diagrams providing illustrative but non-limiting examples of methods that may be carried out using the HVAC control system of FIG. 1;

FIGS. 13A-13C are flow diagrams providing illustrative but non-limiting examples of methods that may be carried out using the HVAC control system of FIG. 1;

FIGS. 14A-14F are flow diagrams providing illustrative but non-limiting examples of methods that may be carried out using the HVAC control system of FIG. 1; and

FIGS. 15A-15C are flow diagrams providing illustrative but non-limiting examples of methods that may be carried out using the HVAC control system of FIG. 1.

While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular illustrative embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention.

DESCRIPTION

The following description should be read with reference to the drawings, in which like elements in different drawings are numbered in like fashion. The description is presented largely in terms of screen shots that describe algorithms and symbolic representations of operations on data bits within a computing device. These screen shots, algorithmic descriptions, and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art.

An algorithm is here, generally, conceived to be a self-consistent sequence of steps leading to a desired result. These steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities

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take the form of electrical or magnetic signals capable of being moved, transferred, combined, compared, and otherwise manipulated. It proves convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, fields, elements, symbols, characters, terms, numbers, or the like. It should be kept in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities.

The present invention also relates to an apparatus for performing the operations. This apparatus may be specially constructed for the required purposes or it may include a general-purpose computer as selectively activated or reconfigured by a computer program stored in the computer. The algorithms presented herein are not inherently related to a particular computer system or other apparatus. In particular, various general purpose computer systems may be used with computer programs written in accordance with the teachings of the present invention, or it may prove more convenient to construct more specialized apparatus to perform the algorithms.

In sum, the illustrative embodiments described herein are preferably implemented for practice by a computing device, e.g., an source code expression is input to the computing device to control operations thereon. It is contemplated that a number of source code expressions, generated in one or more of many computing languages, could be utilized to implement several aspects of the illustrative embodiments of the present invention. A variety of computing systems can be used to practice the present invention, and the selection of a particular computing system can be made for many reasons depending on the circumstances.

FIG. 1 is a schematic view of an illustrative HVAC control system 10 that may be configured to permit an individual to view and/or configure various aspects of operation of an HVAC system from a remote location. The illustrative HVAC control system 10 includes a building control appliance 12 having a first port 14 and a second port 16. A first network 18 may be in communication with first port 14 and/or a second network 20 may be in communication with second port 16. As will be discussed, first network 18 may, for example, provide communication between building control appliance 12 and a broader, potentially external network while second network 20 may, for example, provide communication between building control appliance 12 and one or more components of an associated HVAC system.

First network 18 may include one or more elements that permit and/or facilitate communication between building control appliance 12 and another network. In some cases, first network 18 may include a router 22. While router 22 is illustrated as a distinct component, it will be recognized that in some instances router 22 may instead be incorporated into building control appliance 12. Router 22 provides a means of communication between building control appliance 12 and a broader network by connecting, for example, in any appropriate manner to the Internet 24. Router 22 may, for example, connect to Internet 24 via a dial-up connection, a broad-band cable connection, a DSL phone line connection, and/or a fiber-optic connection.

In the illustrative embodiment, second network 20 may provide for communication between building control appliance 12 and one or more components of an HVAC system within a building. For example, second network 20 may be connected to one or more communicating thermostats within the building and thus may permit communication between building control appliance 12 and the one or more thermostats. In the illustrated embodiment, second network 20 is

connected to a first thermostat 26, a second thermostat 28, a third thermostat 30 and a fourth thermostat 32. In the illustrative embodiment, the connections between second network 20 and each of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 may be wired, wireless, or some combination thereof, as desired.

One or more of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 may independently be connected (either wirelessly or through a wired connection) to one or more components of an HVAC system (not illustrated). Examples of such components may include heaters, furnaces, boilers, A/C units, dampers, and the like. In some cases, one or more of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 may be connected to and/or may control operations of a single rooftop HVAC unit that may be configured to provide heated air, cooled air and/or fresh air as appropriate and as instructed by first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32, although this is not required.

Each of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 may be of any suitable thermostat type. In some instances, each of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 are independently programmable thermostats or non-programmable thermostat, depending on the application. In some cases, each of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32 may be independently programmable thermostats, but may function in accordance with instructions provided by building control appliance 12, rather than in accordance with their own schedule programming. While a total of four thermostats 26, 28, 30 and 32 are illustrated, it will be recognized that second network 20 may equally communicate with fewer than four thermostats and/or with more than four thermostats, as desired, as well as other devices.

HVAC control system 10 is shown as including a PC (personal computer) 34. As will be discussed in greater detail subsequently, PC 34 may permit a user to view web pages that are provided by building control appliance 12. In some cases, PC 34 may be a desktop computer or a notebook (laptop) computer. In some instances, PC 34 may not be a traditional computer but may instead be a device that is adapted to display web pages, such as a cell phone or a personal digital assistant (PDA).

FIG. 2 provides further illustration of the illustrative building control appliance 12 of FIG. 1. The illustrative building control appliance 12 includes a controller 36 that includes or otherwise implements a web server 38. Controller 36 is coupled to a first port 14 and a second port 16. In the illustrative embodiment, first port 14 provides a connection between controller 36 and first network 18 (see FIG. 1), and second port 16 provides a connection between controller 36 and second network 20 (FIG. 1). In some cases, controller 36 may be programmed with a control algorithm that issues commands to the thermostats 26, 28, 30, and 32 via second network 20 to activate and/or deactivate HVAC equipment that is connected to thermostats 26, 28, 30, and 32.

It will be recognized that building control appliance 12 may be disposed at a first location while PC 34 may be disposed at a second location that is remote from the first location. For example, building control appliance 12 may be located within a basement, utility room, office or other location of a particular building, while PC 34 may be located upstairs within a building manager's office or even in a different building from building control appliance 12. More

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generally, PC 34 may be located at any remote location that has access to the building control appliance 12 via the first network 18.

In some instances, web server 38 of building control appliance 12 may be adapted to provide a summary web page (see FIG. 3B), via first port 14, that displays information pertaining to one or more of the thermostats. In some cases, the summary web page may include information pertaining to two or more thermostats. This may include, for example, two or more of first thermostat 26, second thermostat 28, third thermostat 30 and/or fourth thermostat 32. The particular information that is displayed may be customized for a particular user and/or user class. Controller 36 may be adapted to receive sensor information from the thermostats via second network 20. In some cases, controller 36 may be programmed with a control algorithm that issues commands to the thermostats via second network 20 to activate or deactivate HVAC equipment that is connected to the thermostats.

In some instances, a particular user has a set of user rights, and the information that is displayed on the summary web page may be consistent with the user rights of the particular user. In some cases, the information that is displayed on the summary web page may be limited to information regarding thermostats that are assigned to the particular user, such as the thermostats that control the space of a tenant in a multi-tenant building. In some cases, the information that is displayed on the summary web page may be selected, for example, in accordance with the technical proficiency of the particular user. For example, when the particular user is an HVAC contractor, the information displayed on the summary web page may include configuration and/or setup information, and when the particular user is a tenant of a building the information displayed on the summary web page may not include configuration and/or setup information.

A variety of information may be displayed on the summary web page. Examples of information include but are not limited to one or more of a thermostat identifier for one or more of the thermostats, a current inside temperature reported by one or more of the thermostats, a current outside temperature, a current set point for one or more of the thermostats, a schedule related parameter for one or more of the thermostats, a humidity related parameter that is reported by one or more of the thermostats, a current operating mode of HVAC equipment that is connected to one or more of the thermostats, an alarm related parameter for one or more of the thermostats, a discharge air temperature of HVAC equipment that is connected to one or more of the thermostats, a plenum related pressure of HVAC equipment that is connected to one or more of the thermostats, a relay output related parameter of HVAC equipment that is connected to one or more of the thermostats, a lockout status of HVAC equipment that is connected to one or more of the thermostats, a fan switch status of HVAC equipment that is connected to one or more of the thermostats, a throttle range of HVAC equipment that is connected to one or more of the thermostats, an integral time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, a derivative time of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats, and an anti-siphon authority of the control algorithm used to control the HVAC equipment that is connected to one or more of the thermostats. These are only examples, and it is contemplated that any suitable information may be included on the summary web page, as desired.

In an illustrative embodiment, web server 38 may be adapted to serve up a summary web page in which the information that is displayed includes one or more parameters. In

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some cases, the summary web page may include two or more parameters. Each parameter or setting may be displayed within a corresponding column on the summary web page. In some cases, at least some of the parameters or settings include a hyperlink that, when selected, causes web server 38 to display another web page that includes additional information that is related to the selected parameter or setting.

In some instances, web server 38 may be adapted to provide a summary web page that includes information that has been customized for a particular user or user class. For example, the information that is displayed for a first user or user class may be a first subset of information available to building control appliance 12, while the information that is displayed for a second user or user class may be a second subset of information available to building control appliance 12. The second subset of information may be more comprehensive than the first subset of information. In some cases, the information that is displayed for a third user or user class may be a third subset of information available to building control appliance 12, wherein the third subset of information is more comprehensive than the second subset of information.

In some instances, a floor of a particular building may have more than one thermostat. Web server 38 may be adapted to serve up or otherwise provide one or more web pages that may, for example, be viewed using PC 34 and that may display a graphical representation of a floor plan of the floor of the building. In some cases, web server 38 may permit a user to upload an image file that contains a graphical floor plan for the user's building. The graphical floor plan may be a schematic drawing, a blueprint, a CAD or other computer-generated drawing of a space, an actual photo of a space, and the like.

In some cases, web server 38 may permit a user to drag and drop individual building control device images onto the floor plan via the web page. Likewise, it is contemplated that individual building control device images already on the floor plan may be moved. Each building control device image may represent a building control device such as a thermostat. The relative position into which each building control device image is dropped onto the graphical floor plan may correspond to an actual physical location within the floor plan of the building. In some instances, web server 38 may be adapted to display, on the one or more web pages, a number of individual building control device images in a list so that an individual may select one or more of the individual building control device images and place them appropriately onto the displayed floor plan.

Web server 38 may also be adapted to display information pertaining to a particular building control device when a user clicks on a corresponding building control device image on the floor plan displayed on the one or more web pages served up by web server 38.

In some instances, a building may have a number of different HVAC components such as air handlers controlled by a variety of different control devices such as thermostats, VAV (variable air volume) boxes and the like. Web server 38 may be adapted to serve up one or more web pages via first port 14 (and hence across first network 18) that solicit information pertaining to a potential alarm condition. An example of a potential alarm condition would be if the air temperature within any space or a selected space reached a particular level. A number of other potential alarm conditions are contemplated, including various temperature parameters, various pressure parameters, an offline status of one or more of the thermostats, and/or any other suitable condition. Once the information has been inputted into the one or more web pages served up by web server 38, controller 36 may provide the

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appropriate instructions to each of the individual device controllers over second network 20. Web server 38 may be adapted to provide one or more web pages that report when an alarm condition has been satisfied.

In some instances, web server 38 may be adapted to provide one or more web pages, via first port 14, that solicit and receive information pertaining to user rights privileges. The user rights privileges may control, at least in part, what information can be or is displayed by web server 38 and/or what information can be changed using web server 38. Controller 36 may maintain monitoring information, status information, set point information, alarming information, trending information and/or configuration information, and the user rights privileges control, at least in part, what information can be or is displayed and/or changed via web server 38.

In some cases, building control appliance 12 may be adapted to be coupled, either directly or indirectly, to an HVAC system, and web server 38 may be adapted to provide one or more web pages via first port 14 that allow information related to the HVAC system to be assigned and unassigned to the user rights privileges. In some cases, at least some of the users of building control appliance 12 are assigned user rights privileges.

A user may be allowed to access building control appliance via web server 38, and web server 38 may be adapted to only display information that corresponds to the user rights privileges that are assigned to the user. Each user may be assigned to one of two or more user groups. Each member of a user group may have the same assigned user rights privileges. Web server 38 may be adapted to provide one or more web pages that allow one or more types of information to be assigned and/or unassigned to the user rights privileges of each user group. The user rights privileges may, for example, define viewing privileges and/or changing privileges. For example, one of the user groups may correspond to a tenant group, another of the user groups may correspond to a facility manager group, and another of the user groups may correspond to a contractor group. In some cases, the user rights privileges for the facility manager group may be more expansive than for the tenant group, and the user rights privileges for the contractor group may be more expansive than for the facility manager group.

In some embodiments, web server 38 may be adapted to serve up or otherwise provide one or more web pages that provide information regarding the status of one or more of the thermostats 26, 28, 30 and/or 32. Web server 38 may provide web pages that are arranged for receiving information. In some cases, for example, web server 38 may serve up one or more web pages that solicit and accept configuration information for one or more of the thermostats 26, 28, and/or 32.

A thermostat may employ one or more external sensors such as temperature sensors. In many cases, external temperature sensors are provided having a particular resistance. An installer typically needs to know how to connect the external temperature sensors (which sensor should be used, and which sensors should be connected in series and/or which sensors should be connected in parallel) in order to provide the thermostat with an expected resistance. In some illustrative embodiments, web server 38 may serve up one or more web pages that prompt a user (installer or the like) to provide information pertaining to the external temperature sensors (if any) that will be used with the particular thermostat, and in some cases, the number of remote sensors that will be used.

Web server 38 may then, for example, serve up one or more web pages that provide the installer with a wiring diagram illustrating how a particular combination of external temperature sensors should be combined to form a remote sensing

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network for the thermostat. In some cases, web server 38 may serve up a web page that includes or otherwise provides a predetermined wiring diagram that is based, at least in part, upon the information pertaining to the one or more remote sensors received, including the number of remote sensors and the type of one or more of the remote sensors. In some instances, controller 36 may be adapted to look up a predetermined wiring diagram based upon the information pertaining to the one or more remote sensors.

In some illustrative embodiments, web server 38 may be adapted to provide one or more web pages, via first port 14, that solicit non-schedule thermostat configuration information. The one or more web pages may also receive the solicited information via one or more responses. In some cases, controller 36 may provide at least some of the non-schedule thermostat information to at least some of the thermostats, for example, via the second network 20. The thermostats may, for example, be selected from or may include one or two or more of first thermostat 26 (FIG. 1), second thermostat 28 (FIG. 1), third thermostat 30 (FIG. 1) and/or fourth thermostat 32 (FIG. 1). In some cases, controller 36 may be capable of automatically discovering at least one of the thermostats on second network 20. Controller 36 may provide at least some of the non-schedule thermostat configuration information solicited by the one or more web pages, for each of the thermostats to the corresponding thermostats, via second network 20. In some instances, web server 38 may be adapted to provide one or more web pages that solicit temperature scheduling information and that receive temperature scheduling information via one or more responses.

The web pages served up by web server 38 may include a number of predetermined configuration options for selection by the user. At least some of the predetermined configuration options may, if desired, be presented in a pull-down menu. Examples of predetermined configuration options include, but are not limited to, one or more of a thermostat model option, an equipment type option, a thermostat keypad lock-out option, a system mode option, a fan mode option, a room temperature input designation option, a humidity input designation option, an outdoor temperature input designation option, an occupancy sensor input designation option, a number of cooling stages option, a number of heating stages option, a cooling cycle rate and/or a heating cycle rate.

In some cases, controller 36 may download the non-schedule thermostat configuration information to at least some of the thermostats via second network 20. Sensor information from at least some of the thermostats may be provided to controller 36 via second network 20. Controller 36 may be programmed with a control algorithm that issues commands to the one or more thermostats via second network 20 to activate or deactivate HVAC equipment that is connected to the one or more thermostats, based at least in part on the received sensor information. The control algorithm may be capable of issuing commands to the one or more thermostats via second network 20 to activate or deactivate HVAC equipment that is connected to the one or more thermostats, based at least in part on the received sensor information and a schedule. In some cases, the control algorithm may be capable of issuing commands to the one or more thermostats via second network 20 to activate or deactivate HVAC equipment that is connected to the one or more thermostats, based at least in part on the received sensor information, a schedule, and the non-schedule thermostat configuration information.

In some cases, controller 36 may be adapted to provide one or more commands to at least one of the thermostats, wherein the one or more commands result in one or more of the HVAC units that are connected to the at least one of the thermostats

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to activate and/or deactivate. In some cases, controller 36 implements a control algorithm that includes a programmable schedule, and wherein the one or more commands are based, at least in part, on the programmable schedule. While the thermostats themselves may be capable of operating in accordance with their own local schedule, controller 36 may provide commands that cause the thermostats to operate in accordance with the schedule of the controller 36. That is, and in some cases, the local schedules of the thermostats may be bypassed and not used.

A further description of features of various illustrative embodiments is provided below. For example, FIGS. 11A-10D show illustrative but non-limiting examples of web pages that may be served up by web server 38, and FIGS. 11A-15C show illustrative but not limiting methods that may be carried out in accordance with the present invention.

FIGS. 3A-3F are illustrative but non-limiting examples of web pages that may be served up by web server 38 (FIG. 2). In FIG. 3A, web server 38 has created, provided or otherwise served up a web page 40 that permits a user to log into building control appliance 12. In some cases, a user may log into building control appliance 12 using PC 34 (FIG. 1), but this is not required. Web page 40 may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft Internet Explorer. In some instances, it is contemplated that building control appliance 12 itself may have web page display functionality.

Web server 38 may solicit, via web page 40, a User ID and/or a password, as indicated by a User ID blank 42 and a Password blank 44. Throughout this discussion, it should be recognized that if a blank space that a user may enter information into is shown, other ways of data entry such as a pull-down menu, a series of check boxes or the like may be used. Similarly, in situations in which a pull-down menu is shown, other ways of data entry such as a series of check boxes or blank spaces into which data may be typed or selected may be used.

Once the user ID and password has been entered, a user may log into building control appliance 12 by clicking on a Login button 46. Alternatively, if a user makes a mistake entering either their User ID or their password, they may clear the entered information by clicking on a Reset button 48. In some cases, if the user has forgotten either their User ID and/or their password, they may click on the Forget User ID or Password? link 50. Subsequently, building control appliance 12 may, in response to one or more challenge questions, provide the missing information or, in some cases, may email the missing information to the user as an additional security measure. Web page 40 may also include graphical icons 52 that may, for example, provide identifying information for an HVAC contractor.

Once a user has successfully logged into building control appliance 12 (FIG. 2), web server 38 (FIG. 2) may provide a web page 54 that provides an overview. In some cases, web page 54 includes common elements that are displayed on many of the web pages that web server 38 may be adapted to provide. For example, web page 54 includes a web status bar 56 and a navigation bar 58. Web status bar 56 includes an URL 60 that provides a current web site address and also includes standardized tool bars provided, for example, by Microsoft® Corporation. In some cases, at least some of the text and graphics displayed within web status 56 may be functions of how an individual has customized (or not customized) the web browser, rather than a result of any information served up by web server 38.

In the illustrative embodiment, navigation bar 58 provides information to a user that permits navigating through the

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various web pages that are or may be served up by web server 38 (FIG. 2). Navigation bar 58 may be common to many of the web pages served up by web server 38 and may include several features. A Help button 62 permits a user to, at any time, obtain online assistance pertaining to whatever web page is being served up by web server 38 (FIG. 2). A Logout button 64 permits a user to log out of building control appliance 12 (FIG. 2). Navigation bar 58 may include a Date/Time icon 66 and/or a weather icon 68. In some cases, weather icon 68 may be a link that a user may click on to access local weather information, such as a local weather site. If desired, weather icon 68 may merely provide a current outside temperature.

In the illustrative embodiment, navigation bar 58 may also include one or more of an Overview tab 70, a Floor Plans tab 72, a Schedules 74 tab, an Alarms tab 76, a Trends tab 78, a Users tab 80, a Thermostats tab 82 and/or a System tab 84. Each tab will be described in subsequent figures. In many cases, web status bar 56 may include a position confirmation 86, which provides confirmation of what tab has been selected and is currently active. In FIG. 3B, the Overview tab 70 has been selected, so hence position confirmation 86 includes the text "WebSite Overview". WebSite™ is a trademark owned by Honeywell that relates to features of HVAC control system 10 (FIG. 1). As discussed above, a particular user may be a particular type of user and/or may fall into a particular group or class of users. In some cases, navigation bar 58 may include a user login confirmation 88 that displays the user type or class.

Within Overview tab 70, it can be seen that web page 54 provides a significant amount of information that may in some cases be organized into columns. As illustrated, web page 54 may include one or more of a Thermostat column 302, a Current Temperature column 304, a Setpoints column 306, a Schedule column 308, a Relative Humidity column 310 providing relative humidity data for each of the corresponding thermostats and/or an Alarm column 312 providing alarm information. In some cases, web page 54 may include additional columns (not illustrated) that, for example, provide an HVAC professional with additional information pertaining to HVAC equipment performance such as discharge air temperatures, coolant pressures, and the like. In addition, web page 54 may include fewer columns, if desired.

Thermostat column 302 may provide a columnar list of thermostats that may be assigned or otherwise available to a particular user. Current Temperature column 304 may provide a columnar list of current ambient temperatures sensed by each of the corresponding thermostats within Thermostat column 302.

Setpoints column 306 may provide a columnar list of current temperature set points as well as equipment status for each of the corresponding thermostats within Thermostat column 302. If the HVAC equipment controlled by a particular thermostat is operating, Setpoints column 306 may include one or more icons for each thermostat, indicating the operational status of corresponding HVAC equipment. For example, a snowflake icon may be displayed if air conditioning equipment is operating, or perhaps a flame icon may be displayed if heating equipment is operating.

If a particular thermostat is operating within an Occupied time period (as will be discussed subsequently with respect to Schedule column 308), Setpoints column 306 may include an up arrow and a down arrow that may be clicked on to raise or lower the current setpoint temperature for a particular thermostat. If the particular thermostat is operating within an Unoccupied time period, Setpoints column 306 may, in some cases, not display up or down buttons for adjusting the tem-

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perature set point. In some cases, the up and down arrows may merely be grayed out if the particular thermostat is operating within an Unoccupied time period.

Schedule column 308 may provide a columnar list of schedule information for each corresponding thermostat, such as whether a particular thermostat is operating according to a schedule in which the current time corresponds to an Occupied time or is operating according to a schedule in which the current time corresponds to an Unoccupied time. For example, in a commercial office environment, a particular thermostat may be programmed or otherwise operated in accordance with a schedule in which the Occupied time is set to a time period of 7 AM to 5 PM, and the Unoccupied time is set to a time period of 5 PM to 7 AM. Schedule column 308 may also include an override button 314 for at least one of the corresponding thermostats listed within thermostat column 302.

As shown, web page 54 may include information pertaining to a number of different thermostats. In some instances, it may be desirable to obtain greater information regarding a specific thermostat. To illustrate, one can explore a specific thermostat. For example, thermostat 316 is labeled within Thermostat column 302 as "T7350". A thermostat may be labeled using any appropriate nomenclature. For example, a thermostat may be labeled in accordance with its physical location or any other desired naming system or plan.

By reading a row across the columns, one can see that thermostat 316 is displaying a current temperature of 75° F., and has a current set point temperature of 74° F. As a result, the air conditioning equipment controlled by thermostat 316 is operational, as evidenced by the snowflake icon 318. It can be seen that thermostat 316 is operating in accordance with a schedule that specifies that the current time corresponds to an Occupied time period, as indicated by the occupied icon 320. Consequently, and in the illustrative embodiment, setpoints column 306 includes an up button 322 and a down button 324 that may be used to at least temporarily override the scheduled setpoint. An override button 326 corresponding to thermostat 316 is displayed within Schedule column 308.

FIG. 3C provides a web page 328 that may be served up by web server 38 (FIG. 2) if, for example, a user clicks on the icon representing thermostat 316. It can be seen that navigation bar 58 now indicates that Thermostat tab 82 has been selected. Web page 328 includes a thermostat column 330, a General tab 332 and a Setpoints & Fans tab 334. Thermostat column 330 includes a columnar list of all available thermostats, even though web page 328 was reached by clicking on thermostat 316 (FIG. 3B). If desired, the information displayed in FIG. 3C and FIG. 3D (to be discussed) can be obtained for any of the thermostats listed in Thermostat column 330.

Under General tab 332, as shown, web page 334 includes a pane 336 that provides information regarding thermostat 316 (which is labeled as T7350). As can be seen, pane 336 provides a user with information regarding one or more of thermostat status, current temperature, schedule mode, operating mode, discharge temperature, relative humidity, terminal load, lockout status and fan switch status. Clicking on Setpoints & Fans tab 334 may cause web server 38 (FIG. 3) to serve up a web page 338, as shown in FIG. 3D.

In FIG. 3D, it can be seen that web page 338 includes a pane 340 that includes information regarding setpoint and fan information for thermostat 316 (T7350). In particular, pane 340 displays cooling and heating temperature set points for one or more time periods such as occupied, unoccupied and standby. For example, pane 340 includes an up arrow 342 and a down arrow 344 that may be used to alter the cooling set

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point temperature during the occupied time period. Pane 340 includes a pull-down menu 346 that may be used to alter a schedule override duration.

Pane 340 also includes settings pertaining to a fan switch and a system switch. In particular, pane 340 includes a pull-down menu 348 that may be used to alter a setting such as Auto, cool, heat and the like for the system switch as well as a pull-down menu 350 that may be used to set the fan switch to either On or Auto. A Save button 352 permits a user to save any changes that they have made in the parameters displayed within web page 352. In some instances, the Save button 352 may be omitted, and web server 38 (FIG. 2) may ask a user if changes should be saved if any parameter values or settings were altered and if the user attempts to exit a particular web page by, for example, selecting another tab within navigation bar 58. Alternatively, the changes may automatically be saved.

Returning briefly to FIG. 3B, if a user clicks on override button 326, web server 38 (FIG. 2) may provide web page 354, as seen in FIG. 3E. Web page 354 may be simpler in appearance than web page 54 (FIG. 3B) and may in some instances be a pop-up page that floats atop web page 54. Web page 354 includes a pull-down menu 356, which permits a user to determine how to override the current status of a particular thermostat. For example, if the current status is occupied, a user may override the current status by changing it to unoccupied. A length of the override period may be set using pull-down menu 358, which may be used to set a number of days and/or pull-down menu 360, which may be used to set a number of hours.

Once an override time period has been established, a user may wish to specify which thermostat or thermostats to apply the override condition. In some cases, web page 354 may include a check box 362 that provides a quick and simple way to select all of the thermostats that are available to the user. Alternatively, web page 354 may provide a pane 364 that includes a list of all available thermostats and permits the user to check off the thermostats that are to be included. As illustrated, it can be seen that there is a check mark in the check box adjacent the thermostat labeled as T7350 (thermostat 316). A user may then elect to initiate the override by clicking on an OK button 366 or may cancel the impending override by clicking on a Cancel button 368.

In some cases, a summary web page may provide less information than described thus far. FIG. 3F provides an example web page 370 in which navigation bar 58 includes fewer icons than shown in web page 54 (FIG. 3B). In particular, web page 370 includes Overview tab 70, Schedules tab 74 and Users tab 80. However, Floor Plans tab 72, Alarms tab 76, Trends tab 78, Thermostat tab 82 and System tab 84 (all present in web page 54) are notably absent from web page 370. Web page 370 may represent a summary or overview web page for a user that has, for example, restricted tenant privileges. In this case, a user such as a Contractor or a Facilities Manager may have determined, for example, that the user has no need for access to the trending functionality, and may have restricted the user's rights accordingly. Similarly, an authorized user may have determined that, for one reason or another, they do not wish the tenant to be able to adjust the schedule, configure any thermostats or alarms, or make any changes to system configurations. In some cases, the user may decide, for one reason or another, that more or less information is desired on the summary page. It is contemplated that the amount and/or type of information that is included on the summary page may be user definable to provide a custom look. This may be set on a user basis, a user class basis, a user rights basis, or any other basis, as desired.

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FIGS. 4A-4E provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 4A-4E provide web pages pertaining to the Floor Plans tab 72 (see FIG. 3B) and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 4A-4E may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 4A shows a web page 400 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Floor Plans tab 72 disposed within navigation bar 58. Web page 400 includes a floor plans column 402, a View Floor Plan tab 404 and a Setup Floor Plan tab 406. Web page 400 represents a web page that may be served up as a result of a user clicking on the View Floor Plan tab 404. Building control appliance 12 (FIG. 1) permits a user to upload or otherwise import a graphical representation of a building floor plan and then arrange thermostats on the graphical representation of the building floor plan.

Floor plans column 402 may list, either graphically or alphanumerically, one or more floor plans that may be accessed by the current user. In the illustrated web page 400, floor plans column 402 includes clickable links to a North annex floor plan and a Main Offices floor plan (illustrated). There is also a link for adding a new floor plan. Clicking on the "Add New Floor Plan" link may cause web server 38 (FIG. 2) to serve up one more web pages that permit a user to select or upload a new floor plan graphic, add and/or configure thermostats, and the like. Web page 400 includes a pane 408 that provides a graphical representation 410 of (in this case) the Main Offices floor plan. As illustrated, the Main Offices floor plan includes a thermostat 412 labeled as T7350 and a thermostat 414 labeled as Z01 Main Conference superimposed thereon.

By clicking on one of the thermostat icons 412 or 414, web page 400 provides a pane 416 that displays information regarding the selected thermostat. In FIG. 4A, the user has clicked on thermostat 412 in pane 408, and therefore web server 38 (FIG. 2) has displayed information pertaining to thermostat 412 within pane 416. If a user wished to view information pertaining to thermostat 414, they would simply click on thermostat 414 in pane 408. It will be recognized that the information displayed in pane 416, pertaining to thermostat 412 (labeled T7350) is the same as the information previously displayed for this thermostat in FIGS. 3B, 3C and 3D.

FIG. 4B shows a web page 418 that may result from a user clicking on Setup Floor Plan tab 406. It will be noted that in FIG. 4B, thermostat 412 has been moved from the left side of a room to the right side of a room. Web server 38 (FIG. 2) may be adapted to permit a user to move thermostats to correspond to their actual physical location within the physical floor space. In the illustrative embodiment, a thermostat may be moved within web page 418 by clicking on the thermostat and dragging the thermostat to a new location before releasing the mouse button. As illustrated, pane 416 does not display any specific thermostat information because no thermostat icon has been clicked.

Web page 418 may include a floor plan modification bar 420 that permits a user to, for example, change the image selected to represent the floor plan or to even delete the image. Floor plan modification bar 420 permits a user to save a current floor plan or even delete the current floor plan. Floor plan modification bar 420 includes an Add Thermostat button 422 that, in conjunction with web server 38 (FIG. 2), permits a user to add one or more additional thermostats to floor plan

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418. In response to a user clicking on Add Thermostat button 422, web server 38 may display a pop-up web page 424, as seen in FIG. 4C.

Web page 424 of FIG. 4C may be simpler in appearance than web page 418 (FIG. 4B) and may in some instances be a pop-up page that floats atop web page 418. In some instances, web server 38 (FIG. 2) serves up web page 424 so that a user may select one or more thermostats to add to floor plan 410 (FIG. 4B). In some cases, web page 424 may include a check box 426 that provides a quick and simple way to select all of the thermostats that are available to the user. Alternatively, web page 424 may provide a pane 428 that includes a list of all available thermostats, and permits the user to check off the thermostats that are to be included. As illustrated, it can be seen that there are check marks in the check boxes adjacent the thermostat labeled as UpperLevel and the thermostat labeled as Office. These names may, for example, represent physical locations of the thermostats within a space, if desired. A user may verify the selection by clicking on an OK button 430 or may cancel the impending override by clicking on a Cancel button 432.

Once the user has clicked OK button 430, web server 38 (FIG. 2) may serve up web page 434, as seen in FIG. 4D. It can be seen that the newly selected thermostats have been graphically displayed as thermostat 436 (labeled as UpperLevel) and as thermostat 438 (labeled as Office). A user may position thermostat 436 and/or thermostat 438 in appropriate positions on floor plan 410 by dragging and dropping thermostat 436 and/or thermostat 438 onto floor plan 410 using, for example, a mouse. FIG. 4E shows web page 434 once thermostat 436 and thermostat 438 have been dropped into their respective positions on floor plan 410.

FIGS. 5A-5D provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 5A-5D provide web pages pertaining to the Schedules tab 74 (see FIG. 3B) and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 5A-5D may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 5A shows a web page 500 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Schedules tab 74 disposed within navigation bar 58. Web page 500 includes a Schedule column 502, an Assigned Thermostats column 504, a Current Time column 506, a Current State Starts column 508 and a Current State Ends column 510. Web page 500 may include an Add Schedule button 521, which may be used to create one or more additional schedules, as desired.

Schedule column 502 may include a graphical or alphanumeric list of all named schedules that may be available to a particular user. Building control appliance 12 (FIG. 1) may be adapted to accommodate any desired number of different schedules, such as one, two, three, four or more different schedules. As illustrated, web page 500 is displaying two schedules, named Sched1 and Sched2. Sched1 is referenced using a first schedule icon 512 and Sched2 is referenced using a second schedule icon 514. Reading across the columns, it can be seen that thermostat 516 (labeled Office) and thermostat 518 (labeled Z01Main) have been assigned to Sched1. Sched1 is currently in an unoccupied state that runs from 6:00 pm to 7:00 pm. Similarly, it can be seen that thermostat 520 (labeled T7350), which is assigned to Sched2 514, is currently in an occupied state that runs from 6:00 am to 10:00 pm. The times assigned to each schedule may be viewed by clicking on the corresponding schedule name.

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For example, if a user clicks on second schedule term 514 (Schedule2), web server 38 (FIG. 2) may serve up web page 522, seen in FIG. 5B. Web page 522 includes Schedule column 502, a Weekly tab 524, a Special Events tab 526 and an Assign Thermostats tab 528. Web page 522 is the result of clicking on Weekly tab 524. Web server 38 is providing a pane 530 that graphically displays the weekly schedule. Pane 530 may include a legend 532 that provides color coding, for example, for the graphically displayed weekly schedule.

In the illustrative embodiment, only a portion of a twenty-four hour time period may be viewed without scrolling, but this is not required. In the time period shown (12:00 am midnight to about 11:30 am), it can be seen that the schedule reflects an unoccupied setting on Saturdays and Sundays during the illustrated time period. During the week (Monday through Friday), the schedule reflects an unoccupied time period from midnight to 6:00 am and an occupied time starting at 6:00 am. This corresponds, for example, to the starting time for the occupied time period shown in FIG. 5A. The schedule can be changed by simply clicking and dragging the boundaries between the unoccupied and occupied time periods.

In the illustrative example, web server 38 (FIG. 2) provides a pane 534 that may graphically and/or alphanumerically list or otherwise display the thermostat or thermostats that are assigned to a particular thermostat. For Sched1, pane 534 lists thermostat 520 (labeled as T7350). This corresponds to the summary information provided by web server 38 on web page 500 (FIG. 5A). The displayed schedule may, if desired, be deleted, reset or saved, by clicking on an appropriate button within change bar 536. Additional information pertaining to thermostat 520 may be obtained by, for example, clicking on thermostat 520.

Clicking on Special Events tab 526 causes web server 38 (FIG. 2) to serve up web page 538, which is shown in FIG. 5C. Web page 538 includes a pull-down menu 540 that permits a user to select from one or more lists of special events. For example, a user may be permitted to choose from a list of US holidays, a list of Canadian holidays, or perhaps a building-specific list of special days. As illustrated, the user has selected a list of US holidays.

As a result, web server 38 provides within web page 538 a pane 542 that displays a list of predetermined holidays such as New Years Day, Independence Day and so on. For each holiday, pane 542 includes both a name of the holiday as well as rules pertaining to when the holiday occurs. For example, Independence Day is always July 4, but in some schedules, it may only be treated as a holiday if July 4 occurs during the work week. In other schedules, such as residential schedules, July 4 may be treated as a holiday regardless of what day of the week it falls on for a particular year.

For any particular listed holiday, a user may either edit or delete the listed holiday by clicking on either an Edit button or a Delete button corresponding to that holiday. For example, many businesses do not treat Columbus Day as a holiday. A facilities manager or other person may simply delete Columbus Day from the list of holidays. For each holiday, a user may edit HVAC settings by clicking the corresponding Edit button. Depending on which holiday is selected, web server 38 (FIG. 2) may for example permit the user to alter the schedule settings (i.e., when the occupied, unoccupied and/or standby periods begin and end) for that day.

Clicking on Assign Thermostats tab 528 causes web server 38 (FIG. 2) to serve up web page 544, which is shown in FIG. 5D. Once a schedule has been created or edited, one or more thermostats may be assigned to the schedule. Web page 544 includes a pane 544 that provides a graphical and/or alpha-

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numeric list of available thermostats and also lists whether or not a particular thermostat is already assigned to a schedule. A pane 546 provides a graphical and/or alphanumeric list of thermostats that are currently assigned to the particular schedule.

If desired, a user may move a thermostat from pane 544 to pane 546 or from pane 546 to pane 544 using transfer buttons 548. In some cases, if a thermostat is already assigned to a different schedule, assigning the thermostat to the current schedule will remove the thermostat from its previously assigned schedule. In some instances, a thermostat that is already assigned to a schedule may not appear within the list of available thermostats within pane 544.

For example, if a user wished to assign thermostat "204_Labs" to Sched1, the user could click on the thermostat to highlight it and then click on the right arrow transfer button. If the user wished to remove the thermostat "Office" from Sched1, they could click on the thermostat to highlight it and then click on the left arrow transfer button. Once done, the user may delete, cancel or save their changes using change bar 536.

FIGS. 6A-6C provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 6A-6C provide web pages pertaining to the Alarms tab 76 (FIG. 3B) and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 6A-6C may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 6A shows a web page 600 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Alarms tab 76 disposed within navigation bar 58. Web page 600 includes a View Alarms tab 602 and a Setup tab 604. Web page 600 represents a web page that may be served up as a result of a user clicking on the View Alarms tab 602. Web page 600 provides a pane 606 that shows, in tabular form, a list of thermostats, an alarm description, a time at which a particular alarm occurred, a time at which the alarm was acknowledged, a time at which the alarm situation was resolved or otherwise returned to normal, and a priority ranking.

A pull-down filter menu 608 may permit a user to list only certain alarms, if desired. For example, a user may use pull-down filter menu 608 to list all alarms (as illustrated), or perhaps only some alarms. Alarms may be filtered in accordance with occurrence date, whether or not they have been acknowledged, or whether the particular alarms have been configured as being high priority, medium priority or low priority. If the pull-down filter menu 608 is used to filter by date, web server 38 (FIG. 2) provides a date box 610 that can be used to enter a suitable date. An Apply Filter button 612 causes web server 38 to filter the displayed alarms in accordance with the selected filter. It will be noted that pane 606 includes a column of check boxes adjacent the listing of thermostats displaying alarms. Once desired check boxes have been checked, the corresponding alarms may be acknowledged using Acknowledge button 614 and/or deleted using Delete button 616.

Clicking on Setup tab 604 may cause web server 38 (FIG. 2) to serve up web page 618, which is shown in FIG. 6B. Web page 618 includes an Alarms list 620. An alarm may be selected from the Alarms list 620 to be edited or even deleted. As seen in Alarm name box 622, web page 618 is currently displaying setup information for an alarm condition named Extreme Temp. Check box 624 indicates that the alarm has been enabled, and a pull-down menu 626 may be used to select the parameter upon which the Extreme Temp alarm will

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be based. In this situation, Space Temperature is the chosen parameter. FIG. 6C shows pull-down menu 626 in an expanded fashion, illustrating parameters that may be chosen.

Returning to FIG. 6B, a low limit box 628 permits a user to set a lower limit by either entering the lower limit or by toggling the value up and/or down. A high limit box 630 permits a user to set a high limit by either entering the high limit or by toggling the value up and/or down. In the illustrated alarm setup, the alarm will be raised if the space temperature drops below 50° F. or goes above 85° F. This has been set as a high priority alarm, as seen by priority pull-down menu 632.

Once an alarm has been configured, web page 618 permits the user to select the thermostat or thermostats to which the alarm will be applied. Web page 618 provides a pane 634 that displays available thermostats, a pane 636 that displays selected thermostats, and transfer buttons 638 that may be used to move thermostats back and forth between pane 634 (available thermostats) and pane 636 (selected thermostats). Once the thermostats have been selected, the user may either delete the alarm via Delete button 640 or save the alarm via Save button 642.

FIGS. 7A-7B provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 7A-7B provide web pages pertaining to the Trends tab 78 (FIG. 3B), and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 7A-7B may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 7A shows a web page 700 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Trends tab 78 disposed within navigation bar 58. Web page 700 includes a Trends column 702, a View Trends tab 704 and a Setup tab 706. Web page 700 represents a web page that may be served up as a result of a user clicking on the View Trends tab 704. Trends column 702 provides a graphical and/or alphanumeric listing of available trends. These may be trends that have previously been configured. Trends column 702 may also include an Add New Trend link 708 that can, as will be discussed, be used to create a new trend.

Web page 700 displays a pane 710 that includes a graphical representation of several parameters. In the illustrated trend, pane 710 provides a comparison of Discharge Air Temperature and Outdoor Air Temperature for a thermostat labeled Office. In some cases, as shown, web server 38 (FIG. 2) may create and/or track a trend that shows two different parameters measured by a single thermostat. In some instances, web server 38 may create and/or track a trend that shows a common parameter measured by two different thermostats. In some cases, web server 38 may create and/or track a trend that shows a single parameter measured by a single thermostat. Other combinations and permutations can be used, as desired.

By clicking on Setup tab 706 or by clicking on Add New Trend link 708, web server 38 (FIG. 2) serves up web page 712, which is shown in FIG. 7B. Web page 712 includes a pane 714 that may be used to input information to create a new trend. As illustrated, pane 714 shows the parameter choices and other settings that were used to create the trend shown in FIG. 7A. A trend name is entered at box 716. A pull-down menu 718 may be used to select the first thermostat and pull-down menu 720 may be used to select the parameter that will be tracked for the first thermostat. Similarly, a pull-down menu 722 may be used to select the second thermostat and pull-down menu 724 may be used to select the parameter that will be tracked for the second thermostat.

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A Sampling Interval pull-down menu 726 permits a user to select how often data points will be plotted while a Time Selector 728 permits the user to select starting and/or stopping points for the chosen trend. Once all parameters have been set and all choices made, the user may either delete the trend using Delete button 730 or save the trend using Save button 732.

FIGS. 8A-8J provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 8A-8J provide web pages pertaining to the Users tab 80 (FIG. 3B) and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 8A-8J may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 8A shows a web page 800 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Users tab 80 disposed within navigation bar 58. Web page 800 includes a User Name column 802, a User Role column 804, a Contact Phone column 806, an Email column 808, an Edit column 810 and a Delete column 812. These are only illustrative. For example, contact Phone column 806 and Email column 808 provide contact information that in some cases may not be used by web server 38. An Add User button 814 may permit a user, depending on their user role, to add one or more users, as will be discussed subsequently.

User Name column 802 provides a graphical and/or alphanumeric listing of all authorized users. In some cases, User Name column 802 may list all users, regardless of the user role of the user currently logged into building control appliance 12 (FIG. 2). In some cases, User Name column 802 may only list users of a particular role or class. For example, web server 38 may only list users that are at or above the level of the current user. A tenant may, for example, see a list of contractors and/or facility managers, but may not see other tenants beyond themselves.

User Role column 804 may provide a graphical and/or alphanumeric listing of the particular user role assigned to each of the displayed users. In some instances, User Role column 804 may include an Add New User link 815 that may be clicked on to add a new user, as will be discussed. In some cases, the user roles or classes may include Contractor, Facility Manager and Tenant. These are only illustrative. A special Contractor labeled Sys.Admin may be a user that has Contractor privileges that cannot be deleted, thereby assuring that HVAC control system 10 (FIG. 1) retains at least one user/contractor. It can be seen that the Delete button (in Delete column 812) has been grayed out for the Sys.Admin.

In the illustrative embodiment, a Contractor is a user that has all privileges assigned and that can perform all tasks. Moreover, a Contractor may delete a user having any role or class. A Facilities Manager is, for example, a building engineer that maintains HVAC equipment and that monitors the HVAC equipment with the help of building control appliance 12 (FIG. 2). In the illustrative embodiment, a Facilities Manager may only delete Tenants and other Facilities Managers. A Tenant only has access to the thermostats that are assigned to the particular Tenant.

Edit column 810 includes an Edit button 816 corresponding to a user named Honeywell® Contractor, an Edit button 818 corresponding to a user named Building Engineer, and an Edit button 820 corresponding to a user named Building Tenant. Clicking on Edit button 816 may cause web server 38 (FIG. 2) to serve up a web page 822, which is shown in FIG. 8B.

Web page 822 includes a Users column 824, a Properties tab 826, an Assigned Thermostats tab 828 and a Privileges tab 830. Web page 822 represents a web page that may be served up as a result of a user clicking on the Properties tab 826. Web page 822 includes a pane 832 that permits Honeywell® Contractor (or another Contractor or the SysAdmin) to enter or edit login information, a pane 834 that pertains to contact information and a pane 836 that pertains to user role and alarm information. A Save button 838 permits the user to save any changed information.

Clicking on Assigned Thermostats tab 828 may cause web server 38 (FIG. 2) to serve up web page 840, which is shown in FIG. 8C. Web page 840 permits a user with sufficient rights to view and/or change the thermostats assigned to a particular user. As illustrated, web page 840 provides information pertaining to the user named Honeywell® Contractor. A pane 842 provides a graphical and/or alphanumeric listing of available thermostats not already assigned to the user while a pane 844 provides a graphical and/or alphanumeric listing of thermostats assigned to the user. As the user is a Contractor in the example shown, all thermostats are assigned and remain assigned to the user, and hence the transfer buttons are grayed out.

Clicking on Privileges tab 830 may cause web server 38 (FIG. 2) to serve up web page 846, which is shown in FIG. 8I. Web page 846 permits a user with sufficient rights to view and/or change the privileges assigned to a particular user. As illustrated, web page 846 provides information pertaining to the user named Honeywell® Contractor. Web page 846 may include a pane 848 that lists functions, a pane 850 that lists privileges that have not been assigned and a pane 852 that lists privileges that have been assigned. As web page 846 provides information for a Contractor (named Honeywell® Contractor), it can be seen that the functions listed in pane 848 have been grayed out, and that all privileges have been assigned. By reviewing the privileges listed in pane 852, it can be seen that users having the Contractor role have substantial authority within building control appliance 12 (FIG. 2).

Web page 846 includes, under Users column 824, a link 854 labeled Building Engineer. Clicking on link 854 may cause web server 38 (FIG. 2) to serve up web page 856, which is shown in FIG. 8J. Web page 856 includes a pane 858 that permits Building Engineer (or another authorized user) to enter or edit login information, a pane 860 that pertains to contact information and a pane 862 that pertains to user role and alarm information. A Delete button 864 permits the user to delete any information that has been entered on web page 856 while a Save button 866 permits the user to save the information.

Clicking on Assigned Thermostats tab 828 may cause web server 38 (FIG. 2) to serve up web page 868, which is shown in FIG. 8C. Web page 868 permits a user with sufficient rights to view and/or change the thermostats assigned to a particular user. As illustrated, web page 868 provides information pertaining to the user named Building Engineer. A pane 870 provides a graphical and/or alphanumeric listing of available thermostats not already assigned to the user while a pane 872 provides a graphical and/or alphanumeric listing of thermostats assigned to the user. Transfer buttons 874 may be used to move thermostats between pane 870 (not assigned) and pane 872 (assigned). In some cases, a pull-down menu 876 may be used to copy the thermostat assignments of another user, if desired. Because Building Engineer is classified as a Facilities Manager and not a Contractor, some thermostats may or may not be assigned to Building Engineer.

Clicking on Privileges tab 830 may cause web server 38 (FIG. 2) to serve up web page 878, which is shown in FIG. 8C.

Web page 878 permits a user with sufficient rights to view and/or change the privileges assigned to a particular user. As illustrated, web page 878 provides information pertaining to the user named Building Engineer. Web page 878 may include a pane 880 that lists functions, a pane 882 that lists privileges that have not been assigned and a pane 884 that lists privileges that have been assigned. Transfer buttons 874 may be used to move privileges between pane 882 (not assigned) and pane 884 (assigned).

As web page 878 provides information for a Facilities Manager (named Building Engineer), it can be seen that the functions listed in pane 880 are not grayed out, and thus may be selected or not selected. Moreover, by comparing pane 884 to pane 852 (FIG. 8I), it can be seen that Building Engineer has fewer privileges to choose from than Honeywell® Contractor. Web page 878 may include, under Users column 824, a link 886 labeled Building Tenant.

Clicking on link 886 may cause web server 38 (FIG. 2) to serve up web page 888, which is shown in FIG. 8I. Web page 888 includes a pane 889 that permits Building Tenant (or another authorized user) to enter or edit login information, a pane 891 that pertains to contact information and a pane 893 that pertains to user role and alarm information. A Delete button 894 permits the user to delete any information that has been entered on web page 888 while a Save button 896 permits the user to save the information.

Clicking on Assigned Thermostats tab 828 may cause web server 38 (FIG. 2) to serve up web page 890, which is shown in FIG. 8I. Web page 890 permits a user with sufficient rights to view and/or change the thermostats assigned to a particular user. As illustrated, web page 890 provides information pertaining to the user named Building Tenant. A pane 891 provides a graphical and/or alphanumeric listing of available thermostats not already assigned to the user while a pane 893 provides a graphical and/or alphanumeric listing of thermostats assigned to the user. Transfer buttons 874 may be used to move thermostats between pane 891 (not assigned) and pane 893 (assigned). In some cases, a pull-down menu 876 may be used to copy the thermostat assignments of another user, if desired.

Clicking on Privileges tab 830 may cause web server 38 (FIG. 2) to serve up web page 892, which is shown in FIG. 8I. Web page 891 permits a user with sufficient rights to view and/or change the privileges assigned to a particular user. As illustrated, web page 892 provides information pertaining to the user named Building Tenant. Web page 891 may include a pane 891 that lists functions, a pane 893 that lists privileges that have not been assigned and a pane 895 that lists privileges that have been assigned. Transfer buttons 874 may be used to move privileges between pane 893 (not assigned) and pane 895 (assigned).

As web page 892 provides information for a Tenant (named Building Tenant), it can be seen that the functions listed in pane 891 are not grayed out, and thus may be selected or not selected. Moreover, by comparing pane 895 to pane 884 (FIG. 8C), it can be seen that Building Tenant has fewer privileges to choose from than Building Engineer Contractor.

In some instances, a user may wish to add a new user. This may be done by clicking on Add New User link 815. In response, web server 38 (FIG. 2) may serve up a web page similar to web page 888 (FIG. 8I), where a user may enter information including login information, contact information, user role information and alarm information. Clicking on an Assigned Thermostats tab may cause web server 38 to serve up a web page similar to web page 890 (FIG. 8I), where a user may enter information pertaining to thermostat assignments. Clicking on a Privileges tab may cause web server 38

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to serve up a web page similar to web page 892 (FIG. 8F), where a user may enter information pertaining to assigned privileges.

FIGS. 9A-9U provide illustrative but non-limiting examples of web page that may be served up by web server 38 (FIG. 2). In particular, FIGS. 9A-9U provide web pages pertaining to the Thermostats tab 82 and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 9A-9U may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 9A shows a web page 900 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the Thermostats tab 82 disposed within navigation bar 58. Web page 900 may include a Thermostats column 902, a Model Type column 904, an Application Type column 906, a Network ID column 908, a Last Updated column 910, a Status column 912, an Edit column 916 and a Delete column 918. These are only illustrative. Thermostats column 902 provides a graphical and/or alphanumeric listing of all thermostats that are available to a particular user while the remaining columns provide information pertaining to each of the thermostats listed in Thermostats column 902. It can be seen that web page 900 includes a configuration toolbar 920 that permits a user to, if desired, copy a thermostat configuration, download or upload, discover connected thermostats and/or add a thermostat.

Thermostats column 902 includes a thermostat icon 918 (labeled as UPPER FLA00D). Clicking on thermostat icon 918 may cause web server 38 (FIG. 2) to serve up a web page 920, which is shown in FIG. 9B. Web page 920 includes a General tab 922 and a Setpoints & Fan tab 924, and is the result of a user clicking on General tab 922. In some cases, web page 920 may include a pane 926 that provides additional information pertaining to the status and configuration of thermostat 918. An Edit Configuration button 928 may be used to edit the configuration of thermostat 918, as will be discussed subsequently.

Clicking on Setpoints & Fan tab 924 may cause web server 38 (FIG. 2) to serve up web page 930, which is shown in FIG. 9C. In some cases, web page 930 may include a pane 932 that permits a user to view and/or edit heating and cooling temperature setpoints for one or more of an occupied time period, an unoccupied time period and/or a standby time period. Pane 932 may also permit a user to view and/or alter an override duration parameter. Web page 930 may include a pane 934 that permits a user to view and/or alter settings for the system switch and/or the fan switch. A Save button 936 permits a user to save any changes that they have made.

Returning briefly to FIG. 9B, clicking on Edit Configuration button 928 may cause web server 38 (FIG. 2) to serve up a web page 938, which is shown in FIG. 9D. Web page 938 includes a graphical and/or alphanumeric representation 940 showing which thermostat configuration is being edited. Web page 938 may include a pane 942 that provides a list of specific thermostat configuration aspects that may be edited. A pane 944 provides a variety of parameter values and/or settings pertaining to the specific thermostat configuration aspect currently being edited. In particular, web page 938 provides a user with the opportunity to view and/or edit parameter values pertaining to Properties (as indicated by Properties being bolded within pane 942).

Web page 938 may include a Reset button 946, a Back button 948, a Next button 950, a Finish button 952 and a Cancel button 954. Because web page 938 represents the first configuration page, Back button 948 is grayed out. A user

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may reset the parameter values using Reset button 946 or they may simply cancel out of configuration via Cancel button 954. If a user wishes to progress sequentially through one or more of the configuration pages, they may navigate using Back button 948 and/or Next button 950. If they only wish to make changes to parameters within particular configuration pages, they may exit using Finish button 952 once they have completed all of their desired parameter value settings.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 956, which is shown in FIG. 9E. Web page 956 includes a pane 958 that provides a variety of parameter values and/or settings pertaining to the specific thermostat configuration aspect currently being edited. In particular, web page 956 provides a user with the opportunity to view and/or edit parameter values pertaining to Inputs (as indicated by Inputs being bolded within pane 942). It can be seen that the Properties configuration has been completed, as evidenced by the check mark next to Properties within pane 942.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 960, which is shown in FIG. 9F. Web page 960 includes a pane 962 that provides a variety of parameter values and/or settings pertaining to Cooling configuration, as indicated by Cooling Configuration being bolded and a check mark adjacent Inputs within pane 942. If a user chooses to, they may view and/or alter advanced settings by clicking on check box 964. If so, web page 960 may provide a pane 966 that permits a user to view and/or alter the advanced settings.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 968, which is shown in FIG. 9G. Web page 968 includes a pane 970 that provides a variety of parameter values and/or settings pertaining to Heating configuration, as indicated by Heating Configuration being bolded and a check mark adjacent Cooling Configuration within pane 942. If a user chooses to, they may view and/or alter advanced settings by clicking on check box 972. If so, web page 968 may provide a pane 974 that permits a user to view and/or alter the advanced settings.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 976, which is shown in FIG. 9H. Web page 976 includes a pane 978 that provides a variety of parameter values and/or settings pertaining to Outputs configuration, as indicated by Outputs being bolded and a check mark adjacent Heating Configuration within pane 942. If a user chooses to, they may view and/or alter advanced settings by clicking on check box 980. If so, web page 976 may provide a pane 982 that permits a user to view and/or alter the advanced settings. The illustrative advanced settings include a throttle range, integral time, derivative time and anticipatory authority for use by the control algorithm to control the associated HVAC equipment.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 984, which is shown in FIG. 9I. Web page 984 includes a pane 986 that provides a variety of parameter values and/or settings pertaining to Setpoints configuration, as indicated by Setpoints being bolded and a check mark adjacent Outputs within pane 942. If a user chooses to, they may view and/or alter advanced settings by clicking on check box 988. If so, web page 986 may provide a pane 990 that permits a user to view and/or alter the advanced settings.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 992, which is shown in FIG. 9J. Web page 992 includes a pane 994 that provides a variety of parameter values and/or settings pertaining to Dehumidifica-

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tion configuration, as indicated by Dehumidification being holded and a check mark adjacent Setpoints Configuration within pane 942.

Clicking on Next button 950 may cause web server 38 (FIG. 2) to serve up web page 996, which is shown in FIG. 9K. Web page 996 includes a pane 997 that provides a variety of parameter values and/or settings pertaining to Wiring Configuration, as indicated by Wiring Configuration being holded and a check mark adjacent Dehumidification Configuration within pane 942. Web page 996 includes a View Wiring button 998 and a View Sensors button 999. It can be seen that as this is the last configuration page, Next button 950 is grayed out.

Clicking on View Wiring button 998 may cause web server 38 (FIG. 2) to serve up web page 901, which is shown in FIG. 9L. The wiring diagrams provided within web page 901 may assist an installer in properly wiring a particular thermostat. Web page 901 may be a pop-up web page that floats atop web page 996 (FIG. 9K).

In use, a thermostat may employ one or more external sensors such as temperature sensors. In many cases, the external temperature sensors are provided having a particular resistance. An installer typically needs to know how to connect the external temperature sensors (which sensors should be used, and which sensors should be connected in series and/or which sensors should be connected in parallel) in order to provide the thermostat with an expected resistance. In some illustrative embodiments, web server 38 may serve up one or more web pages that prompt a user (installer or the like) to provide information pertaining to the external temperature sensors (if any) that will be used with the particular thermostat, and in some cases, the number of remote sensors that will be used.

Web server 38 may then, for example, serve up one or more web pages that provide the installer with a wiring diagram illustrating how a particular combination of external temperature sensors should be combined to form a remote sensing network for the thermostat. In some cases, web server 38 may serve up a web page that includes or otherwise provides a predetermined wiring diagram that is based, at least in part, upon the information pertaining to the one or more remote sensors received, including the number of remote sensors and the type of one or more of the remote sensors. In some instances, controller 36 may be adapted to look up a predetermined wiring diagram based upon the information pertaining to the one or more remote sensors.

In the illustrative embodiment, clicking on View Sensors button 999 (FIG. 9K) may cause web server 38 (FIG. 2) to serve up one or more of web page 903 (FIG. 9M), web page 905 (FIG. 9N), web page 907 (FIG. 9O), web page 909 (FIG. 9P), web page 911 (FIG. 9Q), web page 913 (FIG. 9R), web page 915 (FIG. 9S), web page 917 (FIG. 9T), and/or web page 919 (FIG. 9U). Although not required, each of these web pages may be pop-up web pages that float atop web page 996 (FIG. 9K). These web pages provide the installer with information pertaining to how to wire remote temperature sensors to provide the thermostat with a predetermined resistance.

In particular, web page 903 (FIG. 9M) provides information regarding how to wire a single 20 Kohm temperature sensor to the selected thermostat. Web page 905 (FIG. 9N) provides information regarding how to wire a pair of 10 Kohm temperature sensors. Web page 907 (FIG. 9O) provides information regarding how to wire a pair of 20 Kohm temperature sensors and a 10 Kohm temperature sensor. Web page 909 (FIG. 9P) provides information regarding how to wire a total of four 20 Kohm temperature sensors. Web page 911 (FIG. 9Q) provides information regarding how to wire a total of five 10 Kohm temperature sensors. Web page 913

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(FIG. 9R) provides information regarding how to wire four 10 Kohm temperature sensors and two 20 Kohm temperature sensors. Web page 915 (FIG. 9S) provides information regarding how to wire four 20 Kohm temperature sensors and three 10 Kohm temperature sensors. Web page 917 (FIG. 9T) provides information regarding how to wire a total of six 20 Kohm temperature sensors and two 10 Kohm sensors. Web page 919 (FIG. 9U) provides information regarding how to wire a total of nine 20 Kohm temperature sensors.

FIGS. 10A-10D provide illustrative but non-limiting examples of web pages that may be served up by web server 38 (FIG. 2). In particular, FIGS. 10A-10D provide web pages pertaining to the Systems tab 84 (FIG. 3D) and the corresponding functionality of building control appliance 12 (FIG. 1). The web pages shown in FIGS. 10A-10D may, for example, be accessed and displayed on a computer running a thin client application such as Microsoft® Internet Explorer®.

FIG. 10A shows a web page 1000 that may be reached, from any or nearly any web page that may be served up by web server 38 (FIG. 2), by clicking on the System tab 84 disposed within navigation bar 58. Web page 1000 may include a General tab 1002, an Email Setup tab 1004, a Network Setup tab 1006 and a Login Page Setup tab 1008. Web page 1000 may be the result of clicking on General tab 1002. Web page 1000 includes a pane 1010 that permits an authorized user to view and/or edit various general parameters. Examples of such parameters may include software updates, time and date settings, engineering units, local weather, and the like. A Save button 1012 permits a user to save any changes they may have made.

Clicking on Email Setup tab 1004 may cause web server 38 (FIG. 2) to serve up web page 1014, which is shown in FIG. 10B. Web page 1014 includes a pane 1016 that permits an authorized user to view and/or edit various parameters such as user email addresses and the like.

Clicking on Network Setup tab 1006 may cause web server 38 (FIG. 2) to serve up web page 1018, which is shown in FIG. 10C. Web page 1018 includes a pane 1020 that permits an authorized user to view and/or edit various parameters relating to network settings.

Clicking on Login Page Setup tab 1008 may cause web server 38 (FIG. 2) to serve up web page 1022, which is shown in FIG. 10D. Web page 1022 includes a pane 1024 that permits an authorized user to view and/or edit various parameters relating to the login settings.

The following Figures provide illustrative but non-limiting examples of methods that may be carried out using HVAC control system 10 (FIG. 1). FIGS. 11A-11C, for example, provide examples of methods pertaining to providing a summary web page. FIGS. 12A-12C provide examples of methods pertaining to arranging and/or configuring thermostats on a floor plan. FIGS. 13A-13C provide examples of methods pertaining to batch alarms. FIGS. 14A-14F provide examples of methods pertaining to configuring user roles. FIGS. 15A-15C provide examples of methods pertaining to providing sensor wiring diagrams.

FIG. 11A describes a method of providing a summary web page for HVAC control system 10 (FIG. 1). At block 1102, building control appliance 12 (FIG. 2) permits a user to access HVAC control system 10 via one or more web pages that may be provided, for example, by web server 38 (FIG. 2). At block 1104, the user's identity is recognized. Control passes to block 1106, where web server 38 displays a customized summary web page. The customized summary web page may be customized in accordance with the recognized identity of the user.

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In some cases, the user's identity includes assigned user privileges and the customized summary web page may display information that corresponds to the user's assigned privileges. The displayed information may, for example, correspond to only certain HVAC control devices. If the user is identified as a tenant of a space of a building, the summary web page may, if desired, only include information related to any HVAC control devices pertaining to the tenant's space within the building. If the user is identified as a facility manager of a building, the summary web page may, if desired, include a selected subset of information related to operation of HVAC control devices throughout the building. If the user is identified as a contractor of a building, the summary web page may, if desired, include a selected subset of information related to operation of HVAC control devices throughout the building.

FIG. 11B describes a method of providing a summary web page for HVAC control system 10 (FIG. 1). At block 1108, building control appliance 12 (FIG. 2) permits two or more users to access HVAC control system 10 (FIG. 1) via one or more web pages that may be provided by web server 38 (FIG. 2). At block 1110, a first user may be recognized when the first user accesses HVAC control system 10. Control passes to block 1112, where web server 38 displays a customized summary web page that is customized to the first user and that includes a first subset of information that is available to HVAC control system 10. A second user is recognized when they access HVAC control system 10, as referenced at block 1114. Control passes to block 1116, where web server 38 displays a customized summary web page that is customized to the second user and that includes a second subset of information that is available to HVAC control system 10. In some cases, the second subset of information may be more comprehensive than the first subset of information.

FIG. 11C describes a method of providing a summary web page for HVAC control system 10 (FIG. 1). At block 1108, building control appliance 12 (FIG. 2) permits two or more users to access HVAC control system 10 (FIG. 1) via one or more web pages that may be provided by web server 38 (FIG. 2). At block 1110, a first user may be recognized when the first user accesses HVAC control system 10. Control passes to block 1112, where web server 38 displays a customized summary web page that is customized to the first user and that includes a first subset of information that is available to HVAC control system 10.

A second user is recognized when they access HVAC control system 10, as referenced at block 1114. Control passes to block 1116, where web server 38 displays a customized summary web page that is customized to the second user and that includes a second subset of information that is available to HVAC control system 10. In some cases, the second subset of information may be more comprehensive than the first subset of information.

Control passes to block 1118, where a third user is recognized when they access HVAC control system 10 (FIG. 1). At block 1120, web server 38 (FIG. 2) displays a customized summary web page that is customized to the third user and that includes a third subset of information that is available to HVAC control system 10. In some cases, the third subset of information may be more comprehensive than the second subset of information.

FIG. 12A describes a method of configuring building control devices using HVAC control system 10 (FIG. 1). At block 1202, web server 38 (FIG. 2) may serve up a web page that displays a graphical floor plan. In some cases, the web page may permit the user to upload an image file that contains a graphical floor plan. Web server 38 may provide a list of

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building control devices on the web page. The list may include a number of building control device images. Control passes to block 1206, where building control appliance 12 (FIG. 1) permits a user to drag and drop individual building control device images onto the graphical floor plan in accordance with their actual positions within a building space that is represented by the graphical floor plan.

In some instances, the web page may be displayed in a first computer but may be generated by a second computing device that is remotely located with respect to the first computer. The first and second computer may, in some cases, be in communication via a network such as a local area network (LAN), a wide area network (WAN), or the Internet. The building control device images may, if desired, be or include icons that identify the building control devices. In some cases, the building control devices may be HVAC controllers such as communicating thermostats.

FIG. 12B describes a method of configuring building control devices using HVAC control system 10 (FIG. 1). At block 1202, web server 38 (FIG. 2) may serve up a web page that displays a graphical floor plan. In some cases, the web page may permit the user to upload an image file that contains a graphical floor plan. Web server 38 may provide a list of building control devices on the web page. The list may include a number of building control device images. Control passes to block 1206, where building control appliance 12 (FIG. 1) permits a user to drag and drop individual building control device images onto the graphical floor plan in accordance with their actual positions within a building space that is represented by the graphical floor plan.

At block 1208, the user may be permitted to click on a particular building control device image displayed on the graphical floor plan in order to display control parameters of the building control device represented by the particular building control device image, as referenced at block 1210. Control parameters that may be displayed in this fashion include one or more of temperature data, humidity data and/or schedule data.

FIG. 12C describes a method of configuring building control devices using HVAC control system 10 (FIG. 1). At block 1202, web server 38 (FIG. 2) may serve up a web page that displays a graphical floor plan. In some cases, the web page may permit the user to upload an image file that contains a graphical floor plan. Web server 38 may provide a list of building control devices on the web page. The list may include a number of building control device images. Control passes to block 1206, where building control appliance 12 (FIG. 1) permits a user to drag and drop individual building control device images onto the graphical floor plan in accordance with their actual positions within a building space that is represented by the graphical floor plan. At block 1212, web server 38 (FIG. 2) may permit the user to scale the graphical floor plan in order to, as desired, view an entirety of the graphical floor plan or to expand and view only a portion of the graphical floor plan. In some instances, the user may instead scale or resize the graphical floor plan prior to uploading the image file.

FIG. 13A describes a method of configuring an alarm for one or more HVAC controllers that are connected to a network using HVAC control system 10 (FIG. 1). In some instances, there may be a number of HVAC controllers. The network may include one or more of a local area network (LAN), a wide area network (WAN) or the Internet. At block 1302, web server 38 (FIG. 2) may provide a web page over a network. At block 1304, web server 38 may submit via the web page an alarm condition at which an alarm should be raised. At block 1306, web server 38 accepts the inputted alarm

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condition via the web page and at block 1308, the alarm condition is communicated over the network to the number of HVAC controllers.

The alarm condition may be any suitable parameter. In some cases, an alarm condition may be a temperature parameter. An alarm may be sounded, for example, if an HVAC controller registers a temperature that exceeds the temperature parameter. In some cases, an alarm may be sounded if an HVAC controller registers a temperature that falls below the temperature parameter. A pressure parameter may be a suitable alarm condition. In some cases, an alarm may be sounded if an HVAC controller registers a pressure that exceeds the pressure parameter. In some instances, an alarm may be sounded if an HVAC controller registers a pressure that falls below the pressure parameter. Another illustrative but non-limiting example of a suitable alarm condition includes an online status of one or more HVAC controllers. For example, an alarm may sound if one of the HVAC controllers goes offline.

FIG. 13B describes a method of configuring an alarm for a number of HVAC controllers that are connected to a network such as a LAN or a WAN using HVAC control system 10 (FIG. 1). At block 1302, web server 38 (FIG. 2) may provide a web page over a network. At block 1304, web server 38 may solicit via the web page an alarm condition at which an alarm should be raised. In some instances, building control appliance 12 (FIG. 2) may itself generate one or more alarm conditions. At block 1306, web server 38 accepts the inputted alarm condition via the web page and at block 1308, the alarm condition is communicated over the network to the number of HVAC controllers. The alarm condition may be any suitable parameter as discussed with respect to FIG. 13A. At block 1310, an alarm condition may be reported via a web page when an HVAC controller detects that the alarm condition has been satisfied.

FIG. 13C describes a method of configuring an alarm for a number of HVAC controllers using HVAC control system 10 (FIG. 1). At block 1312, an alarm condition may be inputted. The alarm condition may be communicated to each of the number of HVAC controllers via a network, as referenced at block 1314. In some cases, the alarm condition is not communicated to each of the number of HVAC controllers, but rather building control appliance 12 (FIG. 2) monitors signals from each of the HVAC controllers to ascertain if an alarm condition has been reached by any of the HVAC controllers. One or more of the HVAC controllers may be communicating thermostats, but this is not required. In some cases, a web page that is accessed via the network solicits the alarm condition and may in some cases permit a user to enter the alarm condition or perhaps permit the user to select the alarm condition from a list or pull-down menu of predetermined alarm conditions. In some cases, the alarm condition may be one or more of a temperature parameter, a pressure parameter or an online status parameter.

FIG. 14A describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is either directly or indirectly coupled to an HVAC system of a building for a number of HVAC controllers. At block 1402, web enabled building control appliance 12 may provide one or more web pages that display information related to the operation of the HVAC system of the building. Control passes to block 1404, where building control appliance 12 may control what information may be accessed by a first user, based at least in part upon the defined user rights privileges that are assigned to the first user. In some cases, the user rights privileges define one or more of viewing privileges and/or changing privileges.

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FIG. 14B describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is either directly or indirectly coupled to an HVAC system of a building for a number of HVAC controllers. At block 1402, web enabled building control appliance 12 may provide one or more web pages that display information related to the operation of the HVAC system of the building. Control passes to block 1404, where building control appliance 12 may control what information may be accessed by a first user, based at least in part upon the defined user rights privileges that are assigned to the first user. At block 1406, one or more web pages are provided by building control appliance 12 that solicit and/or receive information pertaining to user rights privileges for the first user.

FIG. 14C describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is either directly or indirectly coupled to an HVAC system of a building for a number of HVAC controllers. At block 1402, web enabled building control appliance 12 may provide one or more web pages that display information related to the operation of the HVAC system of the building. Control passes to block 1404, where building control appliance 12 may control what information may be accessed by a first user, based at least in part upon the defined user rights privileges that are assigned to the first user. At block 1408, building control appliance 12 may control what information can be accessed by a second user based, at least in part, on defined user rights privileges that are assigned to the second user. In some cases, the user rights privileges of the second user allow access to more information than the user rights privileges of the first user.

FIG. 14D describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is either directly or indirectly coupled to an HVAC system of a building for a number of HVAC controllers. At block 1402, web enabled building control appliance 12 may provide one or more web pages that display information related to the operation of the HVAC system of the building. Control passes to block 1404, where building control appliance 12 may control what information may be accessed by a first user, based at least in part upon the defined user rights privileges that are assigned to the first user.

At block 1408, building control appliance 12 may control what information can be accessed by a second user based, at least in part, on defined user rights privileges that are assigned to the second user. In some cases, the user rights privileges of the second user allow access to more information than the user rights privileges of the first user. Control passes to block 1410, where one or more web pages are provided by building control appliance 12 that solicit and/or receive information pertaining to user rights privileges for the second user.

FIG. 14E describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is either directly or indirectly coupled to an HVAC system of a building for a number of HVAC controllers. At block 1402, web enabled building control appliance 12 may provide one or more web pages that display information related to the operation of the HVAC system of the building. Control passes to block 1404, where building control appliance 12 may control what information may be accessed by a first user, based at least in part upon the defined user rights privileges that are assigned to the first user. At block 1412, one or more web pages are provided by building control appliance 12 that allow selected information related to the operation of the HVAC system of the building to be assigned and unassigned to certain user rights privileges.

FIG. 14F describes a method of configuring privileges for a building control appliance 12 (FIG. 1) that is coupled to one

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or more HVAC control devices. At block 1414, a user is permitted to enter a user name for an individual via a web page that is provided by building control appliance 12. The user is permitted to enter a user group for the individual via the web page, as referenced at block 1416. Control passes to block 1418, where user rights privileges may be assigned to the individual as a result of their user group. In some cases, the user rights privileges may include viewing privileges that dictate what information the user may view on a web page provided by building control appliance 12 and/or may include assigning feature privileges that may dictate what parameters or features a user may modify via a web page provided by building control appliance 12. In some cases, feature privileges may be selected from a list of available feature privileges.

FIG. 15A describes a method of generating a wiring diagram. At block 1502, web server 38 (FIG. 2) may serve up one or more web pages that solicit information pertaining to one or more remote sensors that are to be connected to a thermostat. At block 1504, web server 38 receives the inputted information regarding the remote sensors. Control passes to block 1506, where building control appliance 12 (FIG. 1) determines a wiring configuration for the remote sensors. At block 1508, web server 38 serves up one or more web pages that include a wiring diagram for the remote sensors that is consistent with the determined wiring configuration. In some instances, the wiring configuration may be at least partially dependent upon the thermostat type of the thermostat. The wiring diagram may, in some cases, provide information for creating a remote sensing network to provide a desired resistance to the thermostat.

FIG. 15B describes a web based method of providing weighting information for a number of remote sensors in an HVAC system. At block 1510, web page 38 may serve up a web page that permits a user to enter information pertaining to a number of remote sensors to be used with an HVAC controller of the HVAC system. Control passes to block 1512, where building control appliance 12 (FIG. 1) determines sensor weighting information that is based, at least partially, upon the entered information. At block 1514, web server 38 serves up a web page that displays the weighting information.

In some cases, the number of remote sensors may include wireless sensors, and the weighting information may be programmed or otherwise inputted into the HVAC controller. The number of remote sensors may include hard-wired sensors, and the weighting information may include a graphical representation of a remote sensor wiring diagram. In some instances, the user may be at a first location, with a first data processor that displays web pages, and a second data processor that determines the weighting information may be at a second location remote from the first location. In some cases, the HVAC controller may be at the second location. The first data processor and the second data processor may be connected via a network that may include the Internet.

FIG. 15C describes a web based method of providing a remote sensor wiring diagram for a number of remote sensors in an HVAC system. At block 1516, web page 38 may serve up a web page that permits a user to enter information pertaining to a number of remote sensors to be used with an HVAC controller of the HVAC system. Control passes to block 1518, where building control appliance 12 (FIG. 1) determines a remote sensor wiring diagram that is based, at least partially, upon the entered information pertaining to the number of remote sensors. At block 1520, web server 38 outputs a web page that includes the remote sensor wiring diagram.

In some instances, the remote sensor wiring diagram may include or be a graphical representation. The remote sensor

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wiring diagram may be configured, for example, to provide a predetermined assistance to the HVAC controller and/or to provide an installer with information regarding which of the remote sensors, if any, to wire in series and which of the remote sensors, if any, to wire in parallel. In some cases, determining a remote sensor wiring diagram may include looking up a predetermined wiring diagram based on the accepted information pertaining to the number of remote sensors.

The present disclosure should not be considered limited to the particular examples described above, but rather should be understood to cover all aspects of the disclosure as fairly set out in the attached claims. Various modifications, equivalent processes, as well as numerous structures to which the present disclosure can be applicable will be readily apparent to those of skill in the art to which the present disclosure is directed upon review of the instant specification.

We claim:

1. A web enabled building control appliance, comprising: a controller; a first port coupled to the controller, the first port configured to communicate over a first network; a web server implemented by the controller and coupled to the first port for serving up one or more web-pages on the first network via the first port; a second port coupled to the controller, the second port configured to be coupled to one or more thermostats via a second network, wherein each of the one or more thermostats are configured to communicate with the controller over the second network; the web server is configured to provide one or more web-pages via the first port that allow a user to log into the web enabled building control appliance; and once the user is logged into the web enabled building control appliance, the web server is configured to provide one or more web-pages via the first port that solicit and receive user rights privileges for each of at least two users, wherein once the user rights privileges are set, the user rights privileges are used by the web enabled building control appliance to control what information can be changed via the web server and/or what information can be displayed via the web server for each of the at least two users when each of the at least two users are logged into the web enabled building control appliance.
2. The web enabled building control appliance of claim 1, wherein the second port is configured to be coupled to two or more thermostats via the second network.
3. The web enabled building control appliance of claim 1, wherein the controller maintains monitoring information, status information, set point information, alarming information, trending information and/or configuration information, and the user rights privileges control, at least in part, what information can be displayed and/or changed via the web server.
4. The web enabled building control appliance of claim 3, wherein the web enabled building control appliance is configured to be coupled, either directly or indirectly, to an HVAC system, and the web server is configured to provide one or more web-pages via the first port that allow information related to the HVAC system to be assigned and unassigned to the user rights privileges.
5. The web enabled building control appliance of claim 1, wherein at least some of the users of the web enabled building control appliance are assigned user rights privileges.
6. The web enabled building control appliance of claim 5, wherein each of the at least two users are allowed to log into the web enabled building control appliance via the web server, and the web server is configured to only displays

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information on the one or more web-pages that corresponds to the user rights privileges assigned to the particular user.

7. The web enabled building control appliance of claim 6, wherein each user of the web enabled building control appliance is assigned to one of two or more user groups, and wherein each user group has the same assigned user rights privileges.

8. The web enabled building control appliance of claim 7, wherein the web server is configured to provide one or more web-pages via the first port that allow one or more types of information to be assigned and unassigned to the user rights privileges of each user group.

9. The web enabled building control appliance of claim 8, wherein the user rights privileges define one or more of viewing privileges or changing privileges.

10. The web enabled building control appliance of claim 7, wherein one of the user groups corresponds to a tenant group, another one of the user groups corresponds to a facility manager group, and yet another one of the user groups corresponds to a contractor group.

11. A web enabled building control appliance, comprising:

a controller;

a first port coupled to the controller, the first port configured to communicate over a first network;

a web server implemented by the controller and coupled to the first port for serving up one or more web-pages on the first network via the first port;

a second port coupled to the controller, the second port configured to be coupled to two or more HVAC control devices via a second network, wherein each of the two or more HVAC control devices are configured to communicate with the controller over the second network;

the web server is configured to provide one or more web-pages via the first port that allow a user to log into the web enabled building control appliance; and

once a user is logged into the web enabled building control appliance, the web server is configured to access user rights privileges, wherein the user rights privileges control, at least in part, what information can be viewed by the logged in user via the web server.

12. The web enabled building control appliance of claim 11, wherein the user rights privileges control, at least in part, what information can be changed by the logged in user via the web server.

13. The web enabled building control appliance of claim 10, wherein the user rights privileges for the facility manager group is more expansive than for the tenant group and/or the user rights privileges for the contractor group is more expansive than for the facility manager group.

14. The web enabled building control appliance of claim 11, wherein the web server is configured to provide one or more web-pages via the first port that allow a contractor user to assigned and unassigned certain controller information to the user rights privileges.

15. A method of configuring privileges for a web enabled building control appliance that is either directly or indirectly coupled to an HVAC system of a building, the method comprising:

providing one or more web-pages via the web enabled building control appliance that display information related to the operation of the HVAC system of the building;

controlling what information can be accessed by a first user based, at least in part, on defined user rights privileges assigned to the first user, wherein the first user can access at least some information; and

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controlling what information can be accessed by a second user based, at least in part, on defined user rights privileges assigned to the second user, wherein the second user can access more information than the first user.

16. The method of claim 15, further comprising:

provide one or more web-pages via the web enabled building control appliance that solicit and receive user rights privileges for the first user.

17. The method of claim 16, further comprising:

provide one or more web-pages via the web enabled building control appliance that solicit and receive user rights privileges for the second user.

18. The method of claim 15, wherein the user rights privileges define one or more of viewing privileges or changing privileges.

19. The method of claim 15, further comprising:

providing one or more web-pages via the web enabled building control appliance that allow selected information related to the operation of the HVAC system of the building to be assigned and unassigned to certain user rights privileges.

20. A method of configuring privileges for a web enabled building control appliance that is coupled to one or more HVAC control devices, the method comprising the steps of:

permitting a user, via a web page provided by the web enabled building control appliance, to enter a user name for an individual;

permitting the user, via a web page, to enter a user group of the individual; and

assigning user rights privileges to the individual based on the user group of the individual.

21. The method of claim 20, wherein assigning user rights privileges comprises assigning viewing privileges that dictate what information the user may view on a web page provided by the web enabled building control appliance and/or dictate what HVAC control devices may be viewed on a web page provided by the web enabled building control appliance.

22. The method of claim 20, wherein assigning user rights privileges comprises assigning feature privileges that dictate what parameters or features a user may modify via a web page provided by the web enabled building control appliance.

23. The method of claim 22, wherein feature privileges can be assigned to a user by selecting particular feature privileges from a list of available feature privileges.

24. A method of operating a building control appliance that is configured to control an HVAC system of a building, the method comprising:

providing one or more web-pages via the building control appliance that display information on a user interface that is related to the operation of the HVAC system of the building, the user interface being located remotely from the building;

controlling what information can be displayed on the user interface by a first user based, at least in part, on defined user rights privileges assigned to the first user, wherein the first user has access to at least some information; and controlling what information can be displayed on the user interface by a second user based, at least in part, on defined user rights privileges assigned to the second user, wherein the user rights privileges of the second user allow access to more information than the user rights privileges of the first user.

25. The method of claim 24, further comprising:

providing one or more web-pages that solicit and receive user rights privileges for the first user via the user interface.

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26. The method of claim 25, further comprising:
providing one or more web-pages that solicit and receive
user rights privileges for the second user via the user
interface.

27. The method of claim 24, wherein the user rights privi-
leges define one or more of viewing privileges or changing
privileges.

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28. The method of claim 24, further comprising:
providing one or more web-pages that allow selected infor-
mation related to the operation of the HVAC system of
the building to be assigned and unassigned to certain
user rights privileges via the user interface.

* * * * *

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: John Douglas Steinberg)
)
Patent No: 10,534,382)
)
Date of Patent: January 14, 2020)
)
Title: SYSTEM AND METHOD)
FOR USING A WIRELESS)
DEVICE AS A SENSOR FOR)
AN ENERGY)
MANAGEMENT SYSTEM)
)
Filed: April 3, 2019)
)

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION BY TAJANA ŠIMUNIĆ ROSING, PH.D., IN SUPPORT
OF REQUEST FOR REEXAMINATION OF U.S. PATENT 10,534,382**

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I, Tajana Šimunić Rosing, hereby declare, affirm, and state the following:

I. INTRODUCTION

1. I have been retained by Alarm.com for the purpose of providing my opinion on the patentability of the claims of U.S. Patent No. 10,534,382 (the “’382 Patent”). My compensation is not dependent in any way on the contents of this Declaration, the substance of any further opinions I may offer, or the ultimate outcome of this matter.

2. I have been asked to give my opinion on whether certain prior art references invalidate claims 1-20 of the ’382 Patent by anticipating them and/or rendering them obvious to those having ordinary skill in the art of the ’382 Patent. As explained in detail below, it is my opinion that claims 1-20 of the ’382 Patent were anticipated by U.S. Patent Pub. No. 2009/0302994 (“Rhee”), and also that claims 1-20 would have been obvious to a person of ordinary skill in the art (“POSITA”) in view of Rhee alone or in combination with other references discussed below.

II. QUALIFICATIONS

3. My curriculum vitae, including my qualifications and a list of the publications that I have authored during my professional career, is attached to this Declaration as Attachment A.

4. I am a full professor, IEEE fellow, and the Frattamico Endowed Chair in the Computer Science and Engineering Department at the University of

California, San Diego, and adjunct full professor in the Electrical and Computer Engineering Department at UCSD. My research focuses on energy-efficient computing, embedded systems hardware, and software design. My place of business is located at 9500 Gilman Drive, La Jolla, California.

5. I am currently a Director of System Energy Efficiency Lab where I am leading a diverse research team on projects relating to system energy-efficiency.

6. I have over twenty-five years of academic and industry experience in applying, designing, studying, teaching, and writing about energy-efficient computing. I have researched and published on topics related to HVAC control systems, occupancy detection and energy efficiency. In addition, my experience has spanned both hardware and software, operating systems and application programs, system communications and user interfaces. I received an Electrical Engineering Ph.D. degree in 2001 from Stanford University; my thesis was titled "Energy Efficient System Design and Utilization." I earlier received an Electrical Engineering B.S. degree in 1992 from Northern Arizona University, an Electrical and Computer Engineering M.S. degree in 1993 from the University of Arizona, and an Engineering Management M.S. degree in 2000 from Stanford University. While at Stanford University I worked in the same office and on the same machines where Yahoo was started, and just down the hall from the office where

Google was started. After completing my M.S. in ECE, I worked at Altera Corporation as a senior design engineer for four years. During and after completing my Ph.D. degree, I worked with Stanford University and Hewlett-Packard Labs leading a team of researchers to develop products for the wireless portable devices market.

7. Through work with Hewlett-Packard Labs, I have been granted the following United States patents:

- U.S. Patent No. 7,272,730, titled “Application-driven method and apparatus for limiting power consumption in a processor-controlled hardware platform,” which issued in 2007 from an application with a priority date in 2003;
- U.S. Patent No. 7,246,181, titled “Device and method for identifying a communication interface that performs an operating parameter closer to a desired performance level than another communication interface performs the operating parameter,” which issued in 2007 from an application with a priority date in 2004; and
- U.S. Patent No. 7,190,980, titled “Method and system for power control in wireless portable devices using wireless channel characteristics,” which issued in 2007 from an application with a priority date in 2004.

8. I have published over 290 publications and received a number of best paper awards and nominations. I have also been an invited speaker at numerous academic and industry conferences. Among various other topics, I have published

articles relating specifically to the wireless sensor networks and building management. A few examples are listed below:

K. Ergun, R. Ayoub, P. Mercati, D. Liu, T. Rosing, "Energy and QoS-Aware Dynamic Reliability Management of IoT Edge Computing Systems," ASPDAC 2021.

R. Chandrasekaran, Y. Guo, A. Thomas, M. Menarini, M. Ostertag, Y. Kim, T. S. Rosing, "Efficient Sparse Processing in Smart Home Applications," ACM SenSys ML, 2019.

Y. Kim, M. Imani, T. Rosing, "Efficient Human Activity Recognition Using Hyperdimensional Computing", IEEE Conference on Internet of Things (IoT), 2018.

Jinseok Yang, S. Tilak, T. S. Rosing, "Transmission manager in heterogeneous applications running WSNs," IEEE Globecom 2015

Baris Aksanli, Alper Sinan Akyurek, Madhur Behl, Meghan Clark, Alexandre Donze, Prabal Dutta, Patrick Lazik, Mehdi Maasoumy, Rahul Mangharam, Truong X. Nghiem, Vasu Raman, Anthony Rowe, Alberto Sangiovanni-Vincentelli, Sanjit A. Seshia, Tajana Simunic Rosing, and Jagannathan Venkatesh. Distributed Control of a Swarm of Buildings Connected to a Smart Grid. 1st ACM International Conference on Embedded Systems For Energy-Efficient Buildings (BuildSys), 2014.

J. Venkatesh, B. Aksanli, Jean-Claude Junqua, Philippe Morin, T. Simunic Rosing, "HomeSim: Comprehensive, Smart, Residential Electrical Energy Simulation and Scheduling," IGCC'13.

9. Since coming to UCSD, I have taught an undergraduate course on logic design, CSE 140, "Components and Design Techniques for Digital Systems," and a graduate course in embedded systems, CSE 237a, "Introduction to Embedded Computing." In my CSE140 course, I cover basics of transistor design, logic circuits, and components, all key components that go into design of processors, and Register-Transfer-Level design. The course ends with a design of a simple MIPS based processor. In CSE 140 I also cover how to estimate performance, and power consumption of a logic circuit. In my graduate CSE237a course, I cover all topics related to design and validation of embedded systems. In the first third of the course, the students learn about all the key hardware components that go into today's embedded systems, including CPUs, GPUs, DSPs, FPGAs, various types of memory, interface design, sensors, actuators, ADC/DAC, communication subsystem, and control system design. The second third of the course is dedicated to embedded software, where we cover issues related to timing, real-time schedulers, and real-time operating system design, and discuss examples of embedded operating systems, including various versions of Linux & Windows used in embedded and mobile computing, Android, and embedded middleware.

The last third of the course is focused on modeling strategies, testing and validation of embedded systems. Throughout the course, the students are expected to complete three projects. The first project requires students to build a mobile system that leverages sensors and actuators and schedules tasks using real-time scheduler implemented within a version of Linux. The second part of the course requires design of an energy efficient power manager within Linux or Android for the hardware designed in part one of the project. The last project is open for students to pick, but has to involve both hardware and software for embedded systems.

10. I consider myself to have significant knowledge and experience in the technologies and subject areas relevant to the '382 Patent, including control systems for HVAC equipment, energy efficiency, wireless communications, client-server computer architectures, and user interfaces.

III. MATERIALS CONSIDERED

11. In forming the opinions expressed herein, I have reviewed and/or considered the following materials:

- U.S. Patent No. 10,534,382 (Exhibit A to the Request for Reexamination of U.S. Patent No. 10,534,382 (the "Request"));
- The File History of U.S. Patent No. 10,534,382 (Exhibit B to the Request; and
- U.S. Patent Pub. No. 2009/0302994 ("Rhee") (Exhibit C to the Request).

- U.S. Patent No. 8,020,777 (“Kates”) (Exhibit D to the Request).
- U.S. Patent No. 8,239,922 (“Sullivan”) (Exhibit E to the Request).

IV. APPLICABLE LEGAL PRINCIPLES

12. I am not an attorney. My understanding of the relevant law is as follows:

A. Claim Construction

13. It is my understanding that, at times, the words or phrases in a patent claim must be interpreted (“construed”).

14. It is also my understanding that a claim of an unexpired patent subject to *Ex Parte* Reexamination proceedings like this one must be given its “broadest reasonable construction in light of the specification of the patent in which it appears”.

B. Anticipation

15. I understand that a claim in an issued patent can be unpatentable if it is not new or novel because it was “anticipated” by the prior art.

16. I have been informed that in order for a claim to be invalid on the basis of “anticipation”, every element of the claim must be found in a single prior art reference or system arranged as in the claim. Prior art anticipates a claim where each element of that claim is found inherently or explicitly in the prior art. To evaluate whether a single item of prior art anticipates a patent claim, I should consider not only what the item expressly discloses, but also what inherently

occurred as a natural result of the practice of the system or method disclosed in the item.

C. Obviousness

17. It is my understanding that a claim in an issued patent can also be unpatentable if it is deemed “obvious”. However, unlike anticipation—which requires that every element of a claim be contained in one prior art reference—obviousness can be demonstrated by combining multiple prior art references to describe every claim element in a patent.

18. I have been told that for a combination of references to render the claims of a patent obvious, there must be motivation or sufficient reasoning to combine the references as well as a reasonable expectation of success in combining the references’ teachings. To determine whether there was an apparent reason to combine those references in the way a patent claims, I may look to interrelated teachings of multiple patents, to the effects of demands known to the design community or present in the marketplace, and to the background knowledge possessed by a person of ordinary skill in the art. Neither a particular motivation nor the alleged purpose of the patentee controls the investigation of obviousness. One of ordinary skill in the art is not confined only to prior art that attempts to solve the same problem as the patent claim. Common sense teaches that familiar items may have obvious uses beyond their primary purposes.

19. It is my understanding that, in assessing the obviousness of claimed subject matter, one should evaluate obviousness over the prior art from the perspective of one of ordinary skill in the art at the time the application was filed (and not from the perspective of either a layman or a genius in that art). (The perspective of what constitutes a person having ordinary skill in the art is discussed below.) The question of obviousness is to be determined based on the following:

- The scope and content of the prior art;
- The differences between the subject matter of the claim and the prior art (whereby, in assessing the possibility of obviousness, one should consider the manner in which a patentee and/or a court has construed the scope of a claim in order to assert infringement against a defendant);
- The level of ordinary skill in the art at the time the subject matter of the claim was allegedly invented; and
- Other relevant objective factors, including the following so-called “*Graham Factors*”:
 - Commercial success of the products or methods covered by the claims;
 - A long-felt need for the alleged invention;
 - Failed attempts by others to make the alleged invention;
 - Copying of the alleged invention by others in the field;
 - Unexpected results achieved by the alleged invention;
 - Praise of the alleged invention by the alleged infringer or others in the field;

- The taking of licenses under the patent by others and the nature of those licenses;
- Expressions of surprise by experts and those skilled in the art at the subject matter of the claim; and
- Whether the patentee proceeded contrary to accepted wisdom of the prior art.

V. OVERVIEW OF THE '382 PATENT

A. General Information

20. The application for the '382 Patent was filed on April 3, 2019. The application claims priority to several other applications, the earliest being a provisional application that was filed on July 14, 2008. In this Declaration I have assumed without comment that the priority date for the '382 Patent is July 14, 2008, the date of that provisional application, although I have not analyzed whether the claims of the '382 Patent are actually entitled to that priority date.

21. The title of the '382 Patent is "System and Method for Using a Wireless Device as a Sensor for an Energy Management System".

22. As its Abstract explains, the '382 Patent discloses the following:

"The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic

HVAC control to reduce unneeded conditioning of unoccupied spaces.”

23. The Field of the Invention of the ’382 Patent is described at 1:16-23:

“This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.”

24. The ’382 Patent states that energy consumption by an HVAC system is directly proportional to the setpoint (*i.e.*, the desired temperature set on a thermostat). Ex. A at 2:15-24. Therefore, allowing the setpoint to rise by several degrees in the summer during periods when the home is unoccupied can result in reduced energy consumption and greater cost savings. *Id.* at 2:24-34. The ’382 Patent explains that it would be desirable to provide a system that could accurately detect occupancy and control the HVAC system accordingly. *Id.* at 3:15-20. For example, the ’382 Patent contemplates detecting occupancy based on a user’s activity patterns on certain “computers or other consumer electronic devices”. *Id.* at 3:24-41.

25. Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the disclosed system:

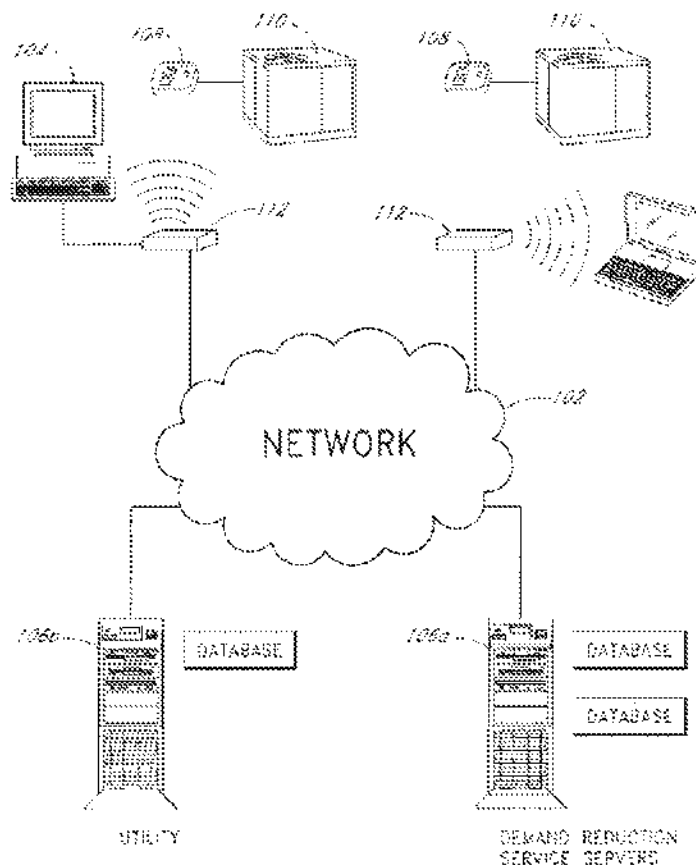


FIG. 2

26. In this depiction, thermostats 108 are connected to and control HVAC units 110. The thermostats 108 communicate with a server 106 over a network. *See id.* at 5:26-42. Users can connect to the server 106 over the Internet via a web browser from computer 104. *Id.* The website hosted by server 106 permits users to perform substantially all of the functions traditionally performed at a physical thermostat. *Id.* at 6:26-37. The computer 104 also reports to the server 106 when

there is activity on the computer (such as keystrokes or cursor movement), so that the server can detect occupancy. *Id.* at 6:58-7:1.

B. Prosecution History

27. The '382 Patent issued from U.S. Pat. App. No. 16/374,085 (the "'085 Application"), which also claimed the benefit of U.S. Pat. App. Nos. 15/002,791 (filed Jan. 21, 2016), 13/470,074 (filed May 11, 2012), 12/502,064 (filed July 13, 2009) and 61/134,714 (filed July 14, 2008). Ex. B at B.210.

28. In an office action dated May 8, 2019, the Examiner rejected all pending claims under 35 U.S.C. § 103 on the basis of U.S. Patent Pub. Nos. 2008/0281472 ("Podgorny") and 2010/0308119 ("Steinberg"). *Id.* at B.167-79. In that same office action, the Examiner also rejected claims 1-19 on the ground of non-statutory double patenting over U.S. Patent Nos. 10,289,131, 9,244,470 and 8,180,492, and rejected claims 19-20 under 35 U.S.C. § 112 ¶ 2. *Id.* at B.160-67. In response, Applicants submitted a terminal disclaimer and requested that the double patenting rejection be withdrawn. *Id.* at B.126. Applicants also amended claim 19 to address the § 112 rejection, and argued that the § 103 rejection should be withdrawn because Steinberg was not prior art. *Id.* at B.127-28.

29. In an office action dated July 17, 2019, the Examiner again rejected all pending claims under § 103 on the basis of Podgorny and U.S. Patent Pub. No.

2005/0270151 (“Winick”). *Id.* at B.084-96. In that same office action, the Examiner also rejected claims 13, 16 and 20 under § 112 ¶ 2. *Id.* at B.083. In response, on April 3, 2019, Applicant amended the claims to all recite (or depend from a claim that recites) that the one or more processors include a processor “located remotely from the memory and is not electrically connected to the memory” and that the memory “is configured to store historical values of the first data and second data”. *Id.* at B.049-54. On September 4, 2019, the Examiner allowed the claims as amended, finding that those limitations were not disclosed in the prior art. *Id.* at B.013-21.

VI. LEVEL OF ORDINARY SKILL IN THE ART

30. It is my opinion, based upon a review of the file history of the ’382 Patent and the other evidence addressed herein, that a person of ordinary skill in the art (“POSITA”) of the ’382 Patent would have had, as of July 14, 2008 (the assumed priority date), (1) a bachelor’s degree in engineering, computer science or a comparable field of study; and (2) two years of (i) professional experience in energy management and controls or (ii) relevant industry experience. In my opinion, additional relevant industry experience may compensate for the lack of formal education or vice versa. I was of more than that level of ordinary skill in the art as of July 2008.

VII. OVERVIEW OF THE PRIOR ART

A. Rhee

31. The Rhee application was filed on June 10, 2008, making it prior art to the '382 Patent. The title of Rhee is "System And Method For Energy Management".

32. As its Abstract explains, Rhee discloses the following:

"The energy management system and/or method includes at least one wireless controller in a wireless network and/or a management server. The wireless controller manages at least one energy device based on one or more parts of an energy profile. The management server manages one or more parts of the energy profile, transmits one or more parts of the energy profile to the wireless controller, and receives energy data from the wireless controller."

33. A representative energy management system in accordance with Rhee is shown in Figure 1B of Rhee:

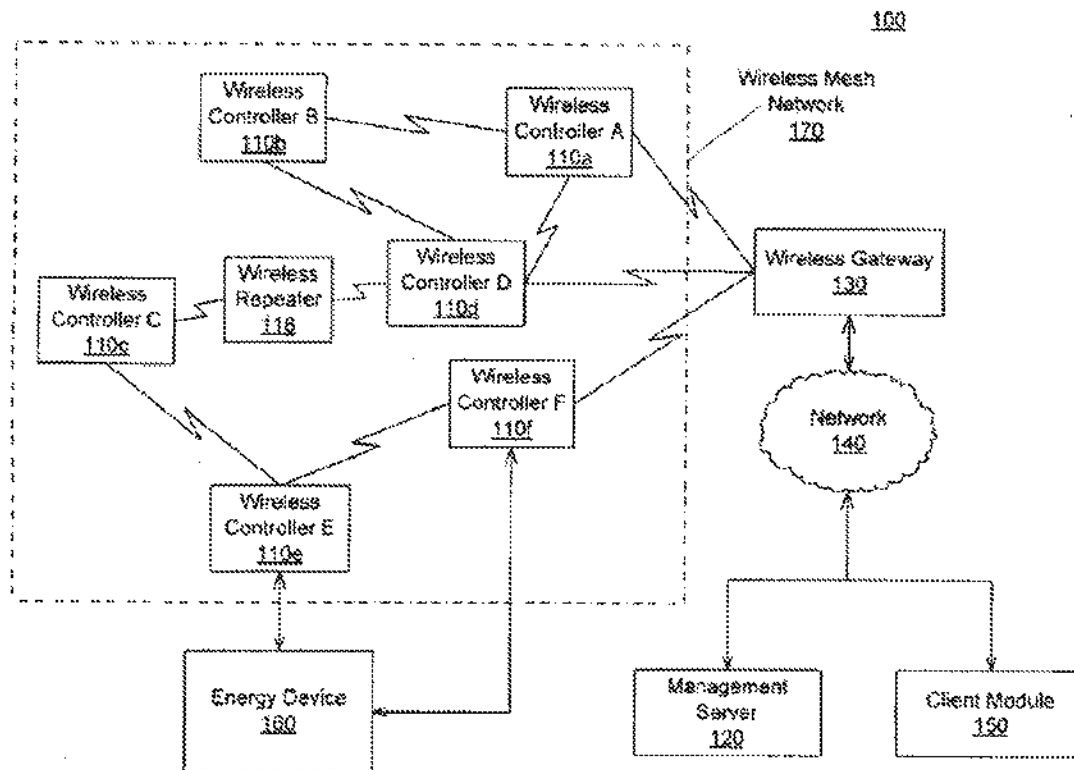


FIG. 1B

34. In this depiction, energy management system 100 includes wireless controllers 110 in a wireless mesh network 110. *Ex. C* at [0045]. Wireless controller 110e “manages (e.g., controls, directs, monitors, etc.)” an energy device 160, which can be a “heater” or “air conditioner”. *Id.* The management server 120 communicates with the wireless controllers via the network and wireless gateway 130 and transmits part of all of an energy profile to the wireless controllers. *Id.* The energy profile can include rules governing how HVAC equipment is controlled. *Id.* at [0038]. Users can manage the system through a web-based user interface to the management server provided by the client module 150. *Id.* at

[0056]. The web-based user interface may be accessed using a mobile device, such as a cellular telephone. *Id.* at [0113].

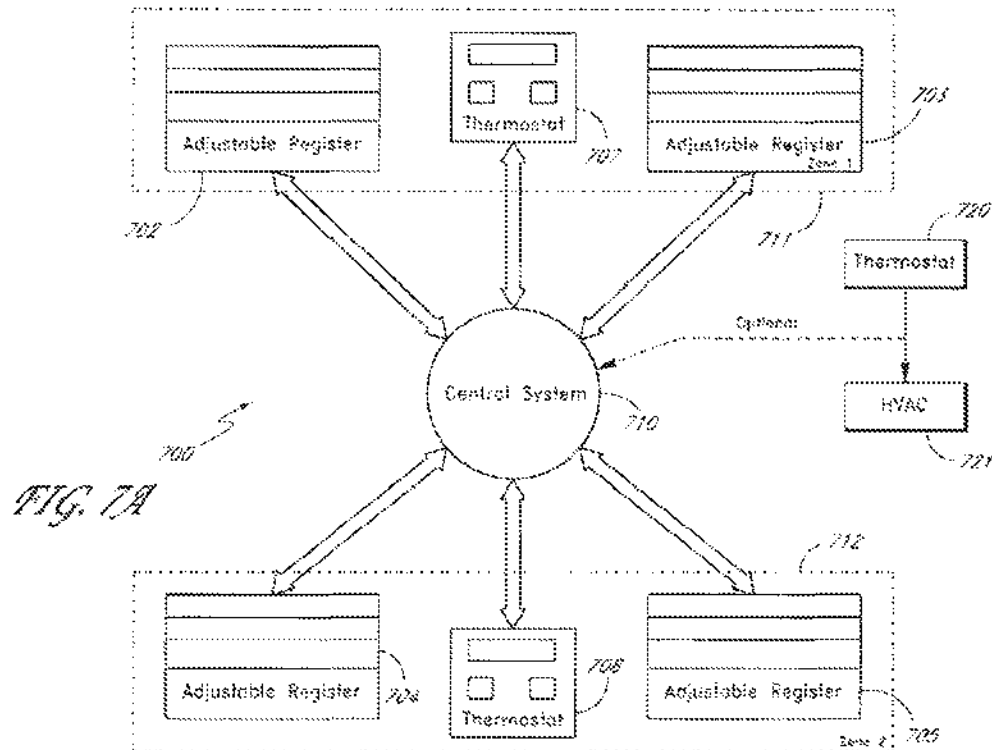
B. Kates

35. The Kates application was filed on January 29, 2007, making it prior art to the '382 Patent. The title of Kates is "System and Method for Budgeted Zone Heating and Cooling".

36. As its Abstract explains, Kates discloses the following:

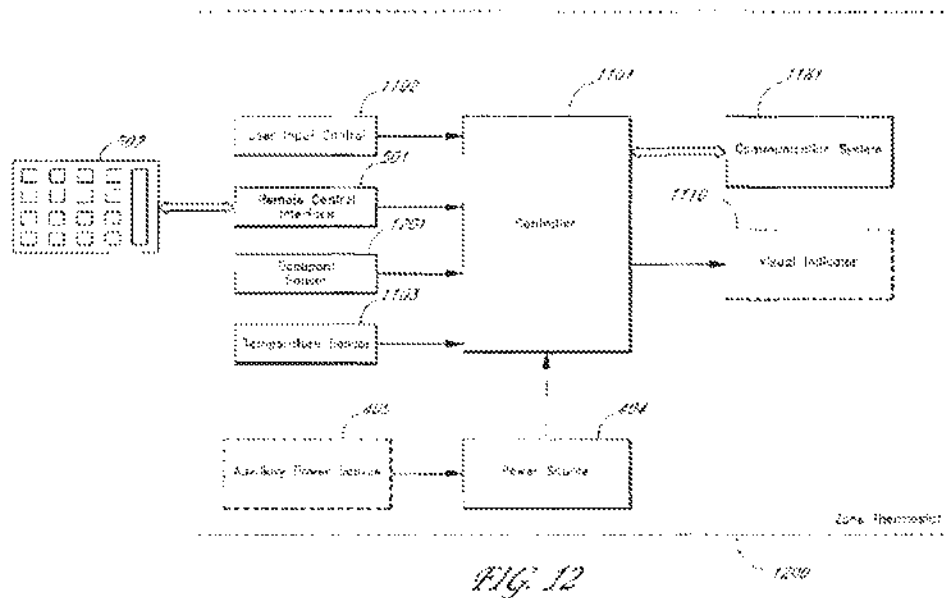
"An Electronically-Controlled Register vent (ECRV) that can be easily installed by a homeowner or general handyman is disclosed. The ECRV can be used to convert a non-zoned HVAC system into a zoned system. The ECRV can also be used in connection with a conventional zoned HVAC system to provide additional control and additional zones not provided by the conventional zoned HVAC system. In one embodiment, the ECRV is configured to have a size and form-factor that conforms to a standard manually-controlled register vent. In one embodiment, a zone thermostat is configured to provide thermostat information to the ECRV. In one embodiment, the zone thermostat communicates with a central monitoring system that coordinates operation of the heating and cooling zones and provides heating and cooling to the various zones according to a cost budget."

37. A block diagram of a centrally-controlled, zoned HVAC system incorporating Kates' ECRV is shown in Figure 7A of Kates:



38. In this depiction, central control system 710 communicates with central thermostat 720, one or more zone thermostats 707, 708 and one or more ECRVs 702-705. *Ex. D* at 8:4-15. Thermostat 720 may communicate with central system 710 so that the central system 710 knows when the thermostat is calling for heating, cooling, or fan. *Id.* at 8:31-37. Additionally, central system 710 coordinates and prioritizes operation of the ECRVs. *Id.* at 8:39-52.

39. Figure 12 depicts a block diagram of a zone thermostat 1200 with remote control for use in connection with the system shown in Figure 7A of Kates.



40. As depicted above, occupant sensor 1201 is provided to the controller 1101. The occupant sensor senses when a zone is occupied, and occupants can program the zone thermostat to bring the zone to different temperatures depending on, among other things, whether the room is occupied or empty. *Id.* at 10:18-33.

C. Sullivan

41. The Sullivan application was filed on August 27, 2007, making it prior art to the '382 Patent. The title of Sullivan is "Remote HVAC Control With User Privilege Setup".

42. As its Abstract explains, Sullivan discloses the following:

"An HVAC control system that accommodates and/or facilitates control from a remote location. The HVAC control system may include a web-enabled building control appliance with a controller, a first port and a second port. The controller may implement a web server that is coupled to the first port for serving up one or more web pages on a first network and for receiving a number of responses. The

controller may be coupled to the second port so as to communicate with one or more communicating thermostats via a second network. The web server may provide one or more web-pages via the first port that solicit and receive user rights privileges.”

43. A schematic view of an illustrative HVAC control system in accordance with Sullivan is shown in Figure 1 of Sullivan:

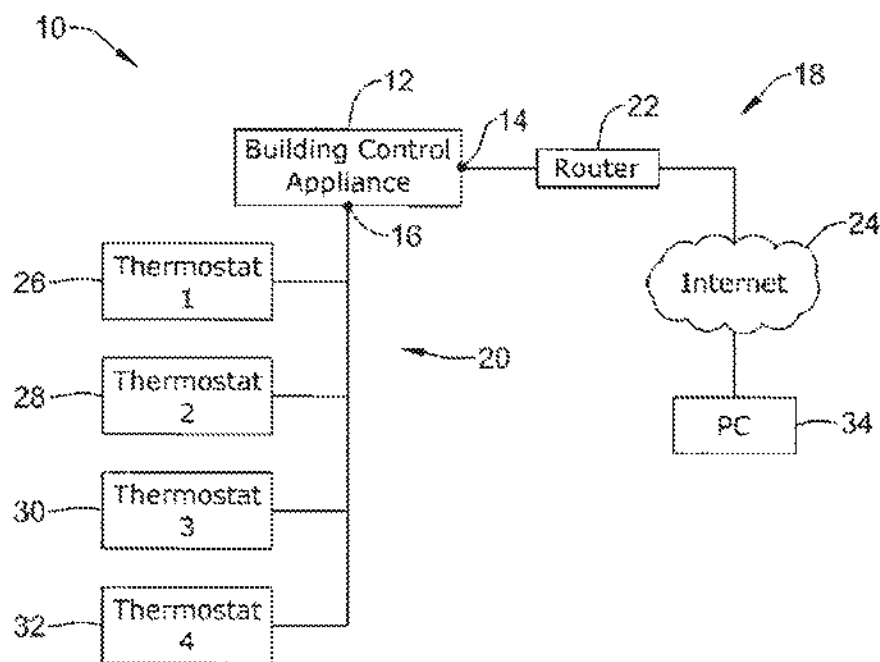
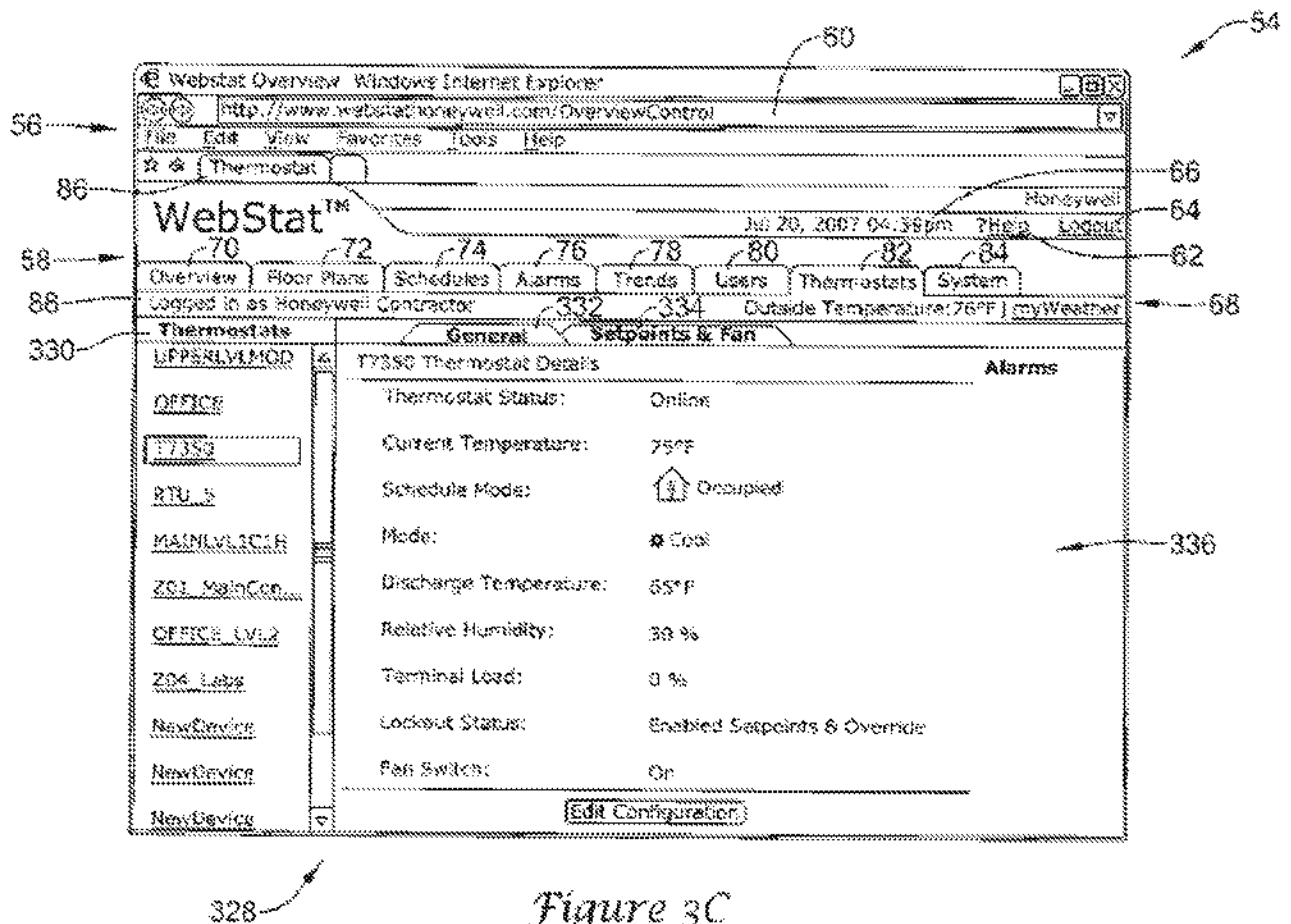


Figure 1

44. In this depiction, HVAC control system 10 comprises, among other things, one or more thermostats 26, 28, 30, 32, an HVAC system (not illustrated), PC 34 (which could include a cell phone or PDA), Internet 24, and building control appliance 12. Ex. E at 3:33-4:46.

45. The building control appliance 12 of Figure 1 included a controller that included and otherwise implemented a web server. *See generally id.* at 4:47-6:53. In some instances, the web server could be adapted to comprise a web-based user interface to monitor and control an HVAC system. *Id.* An example of one such web-based user interface is shown in Figure 3C of Sullivan:



VIII. THE CLAIMS OF THE '382 PATENT ARE ANTICIPATED BY RHEE AND OBVIOUS IN VIEW OF RHEE ALONE OR IN COMBINATION WITH OTHER REFERENCES.

A. Rhee Disclosed an Analogous System to the '382 Patent.

46. As explained above, Rhee disclosed a control system for HVAC equipment. *See supra* Section VII.A. Rhee's wireless controllers (which provided "thermostat functions" (Ex. C at [0085]; Fig. 5) controlled HVAC equipment in conjunction with the management server, which were in wireless communication with one another. *See, e.g., id.* at [0038]. Users were able to remotely manage and access the management server and wireless controllers (and therefore the HVAC equipment) using a mobile device. *Id.* at [0045]; [0056] ("The user and/or the administrator can remotely control the system 100 by directly communicating with the wireless controls 110 by communicating with the management server 120.").

47. This is the same basic architecture as the system of the '382 Patent. As explained above, the '382 Patent disclosed a server in remote communication with a thermostat that controlled HVAC equipment. Ex. A at 5:26-42. Like Rhee, the system of the '382 Patent allowed users to remotely manage and control the HVAC equipment using a mobile device. *See, e.g., id.* at cl. 1[e].

48. The systems of Rhee and the '382 Patent also both had servers that received data over the internet from sensors and wireless controllers/thermostats associated with a building. The '382 Patent claims processors receiving data

associated with a building, including measurements of inside and outside temperature. *See* Ex. A at cls. 1, 4, 5. Likewise, Rhee's wireless controller transmitted "energy data" to the management server, which included "environmental data". Ex. C at [0057]; [0016]; [0040]; [0042]. This "environmental data" included measurements of the inside temperature of the building and the outside temperature of the building. *Id.* The management server received this data from a connection to the Internet (which was a network). *Id.* at [0040]; [0045]. Figure 4 of Rhee illustrates how the inside temperature of the building (as well as other characteristics) was measured using a temperature sensor and transmitted via a wireless gateway to the management server. *Id.* at [0074]-[0075]; [0079].

49. The '382 Patent also claims controlling an HVAC system based on a determination of whether a building is "occupied" or "unoccupied". *See, e.g.*, Ex. A at cls. 1-3, 12. Rhee likewise disclosed an "energy profile" that controlled an HVAC system based on certain modes, including "occupied" and "unoccupied". *See, e.g.*, Ex. C at [0097]-[0098] & Table 8. The system disclosed by Rhee could determine whether a building was occupied or unoccupied based on a schedule or by using a motion detector. *Id.* at [0083] & Fig. 4. Rhee disclosed several examples in which an occupancy determination is part of the "energy profile". *Id.* at [0052] & Table 2; [0061] & Table 4; [0065] & Tables 6, 8. An "energy profile"

may utilize different “operational modes”, including “occupied” and “unoccupied modes”, both of which can be triggered by “occupancy sensors”. *Id.* The “occupied” and “unoccupied modes” of Rhee each were associated with temperature setpoints. *Id.* When the system of Rhee determined that the operational mode had changed, it caused the temperature setpoint to change and the HVAC system would operate according to the temperature setpoint associated with the current occupancy mode. *Id.*

50. As I explained above, the ‘382 Patent claims were allowed during the original examination because the Examiner found the art of record did not disclose (1) that the one or more processors include a processor “located remotely from the memory and is not electrically connected to the memory” and (2) that the memory “is configured to store historical values of the first data and second data”. *See supra* Section V.B. Rhee disclosed both these limitations. First, Rhee disclosed that the management server, which contained the “one or more processors” could use a remote SQL database for storage of “energy data”. *See* Ex. C at [0070] (storage could be remote SQL database). A POSITA would understand from Rhee’s disclosure that the management server could be “not electrically connected to” the SQL database. Second, Rhee disclosed that the storage module (*i.e.*, the SQL database) stored historical values of the first and second data (*i.e.*, inside and outside temperatures) received by the management server. The management server

could display historical values of the inside and outside temperatures to the users, as well as use them in its analysis module.

B. Kates Disclosed an HVAC System Control Based on a Motion Sensor.

51. Kates is a prior art reference that disclosed an HVAC control system that contained analogous elements to Rhee. In particular, Kates disclosed a “central system” computer that could be remotely accessed via the Internet to control HVAC systems. Ex. D at 10:43-54. A POSITA would understand Kates’s central system to be a computer system including processors that executed instructions to control the system. This was analogous to Rhee’s client module. Further, Kates disclosed the use of a motion (or occupancy) sensor to determine occupancy, as did Rhee, and disclosed that the central computer would control the HVAC system based on the occupancy determination as made by the motion sensor. *Id.* at 10:18-33. This disclosure is relevant to certain elements of the ’382 Patent claims that call for making determinations of occupancy, including by a motion sensor.

C. Sullivan Disclosed an Analogous System to the ’382 Patent.

52. Sullivan is another prior art reference that disclosed an HVAC control system that contained analogous elements to Rhee. In particular, Sullivan disclosed a “Building Control Appliance” that could be remotely accessed via a web browser to control HVAC systems. Ex. E at 1:40-45. This was analogous to

Rhee's teachings of accessing the management server via a web interface. Sullivan provided detailed exemplary web pages that could be used to control an HVAC system. *E.g., id.* at Figs. 3A-F. These disclosures are relevant to certain dependent claims of the '382 Patent that require receiving HVAC settings or controlling the HVAC system, each of which is clearly depicted in Sullivan.

D. Motivation to Combine

53. In my opinion, a POSITA would have been motivated to combine features from Kates with Rhee. Both references were directed to remote control of an HVAC system and used a central computer connected to the Internet to do so. Further, Rhee specifically disclosed using an occupancy sensor to determine occupancy of a building, and Kates provided further disclosures concerning this feature. Kates provides further explanation about how occupancy sensors, including motion sensors, could be used to determine occupancy and control an HVAC system. A POSITA would have looked to Kates for further details on how to implement Rhee's teachings of changing modes based on an occupancy sensor, and it would have been obvious to look to Kates's teaching in this respect given both references were directed to HVAC control systems, and used occupancy sensors as inputs for controlling the HVAC system. Further, Kates teachings concerning occupancy determination would have straightforward to implement in

Rhee's management server, which received data from a motion detector, and operated based on occupied and unoccupied modes, like Kates.

54. Likewise, in my opinion, a POSITA would have been motivated to combine features from Sullivan with Rhee. Both references were directed to remote control of an HVAC system and used a central computer connected to the Internet to do so. Further, Rhee specifically disclosed using a web interface to manage the system, but did not provide detailed examples of the web page layouts. Sullivan provided this, and thus a POSITA would have been motivated to combine Sullivan's user interface elements with Rhee to implement the client module that Rhee disclosed.

55. Further, Rhee specifically disclosed using a web interface to manage the system, but did not provide detailed examples of the web page layouts. Sullivan provided this, and thus a POSITA would have been motivated to combine Sullivan's user interface elements with Rhee to implement the client module that Rhee disclosed. And implementing Sullivan's teachings concerning the user interface for controlling an HVAC system would have been straightforward to incorporate into the web interface disclosed by Rhee and well within the skill of a POSITA. Web page user interfaces were well known in the art, and it would be straightforward to apply Sullivan's teachings to the web-based client interface of Rhee to meet the limitations of claims 7-9, 15 and 16 of the '382 Patent

IX. EACH CLAIM OF THE '382 PATENT WAS ANTICIPATED BY RHEE AND OBVIOUS IN VIEW OF RHEE ALONE OR IN COMBINATION WITH OTHER REFERENCES

Claim 1

The Preamble

1. *A system for controlling an HVAC system at a user's building, the system comprising:*

56. To the extent that the preamble is limiting, Rhee teaches element 1[pre] of claim 1.

57. Rhee disclosed an energy management system that comprised a management server and a wireless controller that “manages (e.g., controls, directs, monitors, etc.) an energy device 160 (e.g., *heater, air conditioner*, lights, windmill, etc.)”. Ex. C at [0045]; *see also* [0052] (“[T]he wireless controller C 110c manages heating, ventilating, and air conditioning (HVAC) for the office complex”).

58. Thus, Rhee disclosed a management server and wireless controller used to control an HVAC system—in other words, a system for controlling an HVAC system at a user's building.

Element 1[a]

a memory;

59. In my opinion, Rhee teaches element 1[a] of claim 1.

60. Rhee disclosed a “management server” as a component of the HVAC control system. As disclosed by Rhee, it would have been apparent to a POSITA that the management server was implemented as one or more computers containing one or more processors, memory for storage of instructions and data, along with circuitry. Ex. C at [0104]-[0107]. This fact would also have been obvious as computer servers containing processors and utilizing memory were well known in the art in 2008.

61. Rhee also disclosed that the management server included a storage module, which stores energy data utilizing a database (*e.g.*, a secured SQL database. *See id.* at [0070]. Databases, including SQL databases, were well known in the art, and it would have been apparent to a POSITA that such databases comprise “memory” for storing their data. Moreover, it would have been obvious that a computer server comprised memory.

62. Thus, Rhee disclosed a database which comprised a memory.

Element 1[b]

one or more processors with circuitry and code designed to execute instructions;

63. In my opinion, Rhee teaches element 1[b] of claim 1.

64. As I explained with respect to element 1[a], it would have been apparent to a POSITA that the management server was implemented as one or more computers containing one or more processors, memory for storage of

instructions and data, along with circuitry. *See also* Ex. C at [0048]; [0104]-[0107].

65. Thus, Rhee disclosed a management server which comprised one or more processors with circuitry and code designed to execute instructions.

66. Rhee also disclosed one or more wireless controllers, which communicated with the management server through a wireless gateway to the Internet. *Id.* at [0045]. The controllers would also contain processors that could be included in the “one or more processors”. *Id.* at [0104]-[0107].

67. Moreover, it would have been obvious that a computer server comprised one or more processors that used circuitry and code to execute instructions.

Element 1[c]

the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;

68. In my opinion, Rhee teaches element 1[c] of claim 1.

69. Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the inside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. Figure 4 of Rhee illustrates how the inside temperature of the building (as well as other

characteristics of the building) was measured using a temperature sensor and transmitted via a wireless gateway to the management server. *Id.* at [0074]-[0075]; [0079]. It would have been apparent to a POSITA from Rhee's disclosures that the data received by the management server included inside temperature measured by a temperature sensor in the building, as well as other characteristics of the building.

70. Thus, Rhee disclosed the management server receiving measurements of inside temperature—in other words, the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building.

Element 1[d]

the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet;

71. In my opinion, Rhee teaches element 1[d] of claim 1.

72. Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the outside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. The management server received this data from a connection to the “internet” (which

was a network). *Id.* at [0040]; [0045]. Rhee further disclosed that the outside temperature was measured by a temperature sensor “placed outside of the building”. *Id.* at [0079]; *see also id.* at [0067]. It would have been apparent to a POSITA from Rhee’s disclosures that the data received by the management server (via its Internet connection) included outside temperature measurements collected by a temperature sensor outside of and hence external to the building.

73. Thus, Rhee disclosed the management server receiving temperature measurements collected outside the building from a connection to the Internet—in other words, the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet.

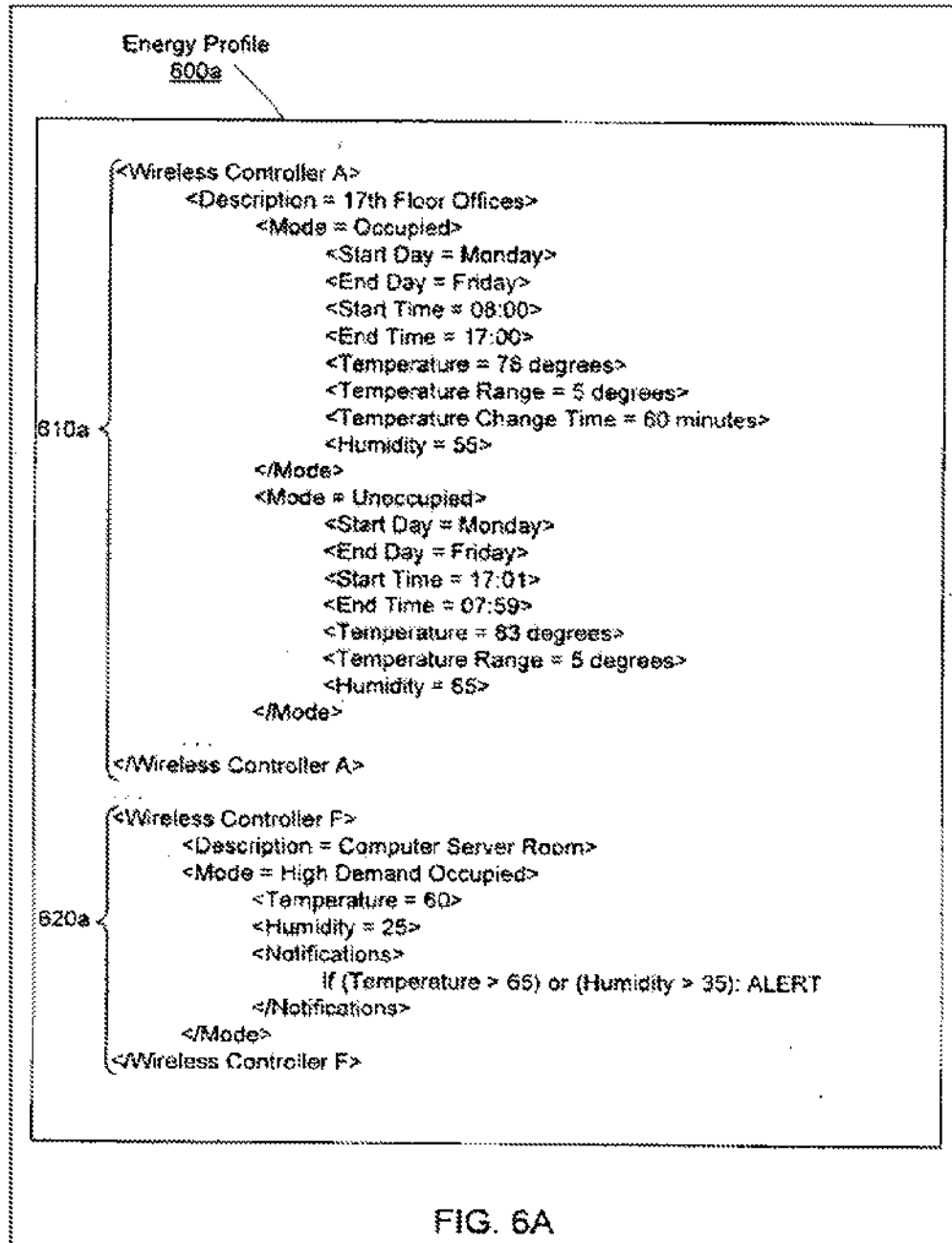
Element 1[e]

the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

74. In my opinion, Rhee teaches element 1[e] of claim 1.

75. Rhee disclosed that the management server maintained an “energy profile” which contained, among other things, a first temperature setpoint that

corresponded to a desired temperature for when the building was occupied, and a second temperature setpoint that corresponded to a desired temperature when the building was unoccupied. *See* Ex. C at [0052] & Table 2; [0056]. Figure 6A provides examples of the two temperature setpoints:



76. Rhee disclosed that the temperature setpoints in the energy profile could be modified by a user using a client module. *Id.* at [0056]. The client module was a user interface to the management server and could communicate with the management server over the network connection. *Id.* at [0045]. Therefore, a POSITA would appreciate that the management server *received* modifications to the desired temperature setpoints for when the building was occupied and unoccupied over a network connection from the client module.

77. Thus, Rhee disclosed that the management server received temperature setpoints corresponding to when the building was occupied and it received temperature setpoints corresponding to when the building was unoccupied—in other words, the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied.

Element 1[f]

the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

78. In my opinion, Rhee teaches element 1[f] of claim 1.

79. Rhee disclosed a client module that provided a user interface for managing the management server. Ex. C at [0056]. The client module could be accessed via a transmitting device for transmitting commands to the management server via the Internet. *Id.* at [0045] & Fig. 1B. The transmitting device of the client module was disclosed to include mobile devices such as cellular phones that communicated wirelessly. *Id.* at [0113]. It would have been apparent to a POSITA that the transmitting device of the client module included mobile wireless devices such as cellular phones running software application code, such as a web browser, that sent commands to the management server over the Internet to control the system. Furthermore, the client module allowed the user to adjust the temperature setpoints stored in the management server's energy profile. *Id.* at [0056]. It therefore would have been obvious to a POSITA that adjusting the setpoint via a web interface would involve the user device sending commands from their mobile device over the Internet to the web server component of the management server.

80. Thus, Rhee disclosed that the management server received commands to change temperature setpoints that were transmitted by a mobile device over the Internet—in other words, the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application

code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system.

Element 1[g]

the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code via the Internet;

81. In my opinion, Rhee teaches element 1[g] of claim 1.

82. As I explained above, Rhee disclosed a client module, including a transmitting device such as a cellular phone, that communicated with the management server via the Internet. Rhee also disclosed that access via the client module was controlled by a “username/password” or “other type of authentication mechanism”, and that different users could be afforded “various granular levels of access.” Ex. C at [0056].

83. A POSITA would have understood such a system to provide information specific to the user who was authenticated, and only such information as that user was authorized to access. *Id.* at [0056] (different users are afforded different levels of access). For example, the management server could support multiple users associated with different building systems. *See, e.g., id.* at [0092] (“For example, an energy management system 100 servicing several schools in

different geographic locations can have one management server 120 managing a separate energy profile for each school”); [0099] (“The profile module 224 modifies (740) the energy profile based on the modifications to the energy profile and/or other parameters (e.g., weather information, user preferences, building preferences, etc.”).

84. A POSITA would have understood that a user would see data only for the particular building (or buildings) or rooms or devices which they were allowed to access. Furthermore, the transmitting device would generate information to present to the user based on the user-specific data it received, for example by displaying a web page. *Id.* at [0056]; [0110]; [0113].

85. This user-specific information concerned the HVAC system and building, such as energy consumption conditions for the HVAC system, the energy profile for the user/building, and the network status. *Id.* at [0056]; [0092].

86. Rhee thus disclosed that the management server sent user-specific data such as energy profiles and energy consumption conditions for the HVAC system to a mobile device over the Internet, and that software on that device, such as a web browser, used the data it received to generate information to display to the user—in other words, the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based

at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code via the Internet.

87. It would also have been obvious to a POSITA from Rhee's disclosure for the management server to send user-specific data to a cellular phone over the Internet so that the device could display user-specific information about the system on a remote user interface (*e.g.*, a web browser). Rhee teaches the use of a mobile device, such as a cell phone, to manage the system by communicating with the management server, and a POSITA seeking to implement that functionality would find it obvious to send user-specific data to the phone (such as HTML code), that the phone would use to render information to the user in the form of a web page.

Element 1[h]

the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature;

88. In my opinion, Rhee teaches element 1[h] of claim 1.

89. Rhee disclosed that the system could determine whether the building was occupied or unoccupied based on a schedule or based on occupancy sensors. Ex. C at [0097] & Table 8. The schedule allowed a user to specify time periods when the building would be occupied and time periods when it would be

unoccupied. *Id.* at [0052] & Table 2; [0061] & Table 4; [0065] & Table 6. This could be done via the client module sending the schedule information to the management server. *Id.* at [0056].

90. A second method was to use one or more occupancy sensors located in the building. This sensor data was transmitted to and received by the management server. *Id.* at [0101]. Rhee disclosed several examples in which an occupancy determination is part of the “energy profile”. *Id.* at [0097] & Table 8. An “energy profile” may utilize different “operational modes”, including “occupied” and “unoccupied modes”, both of which can be triggered by “occupancy sensors”. *Id.* A POSITA would have understood the “occupancy sensors” to refer at least to motion sensors (also called motion detectors) as referenced in paragraph [0083] of Rhee.

91. In either case, the system controlled the temperature of the building according to the occupancy status and the desired temperatures specified for each mode specified in the energy profile.

92. Rhee disclosed that the management server could manage (*e.g.*, control) an energy device (*e.g.*, the HVAC system) independently, or jointly with the wireless controllers. *Id.* at [0037]. For example, based on the energy profile or the energy data, the wireless controller could direct “the heating unit (*i.e.*, one of the energy devices) to activate and heat the room.” *Id.* at [0041]. The management

server stored the energy profile in a storage device (*id.* at [0060]) and received data from wireless sensors (*id.* at [0040]). Thus, it would have been apparent to a POSITA that the management server contained instructions for determining whether the building is currently occupied or unoccupied and for controlling the HVAC system to provide heating or cooling to the building at an operational temperature based on that determination. A POSITA would have understood that the temperature setpoints in the energy profile would cause the HVAC system to provide heating or cooling to the building until the specified temperature was reached.

93. Rhee thus disclosed that the management server determined whether the building was occupied or unoccupied according to a schedule or occupancy sensors, and provided heating or cooling based on that determination as specified in an energy profile for the building—in other words, the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.

94. It would also have been obvious to a POSITA from Rhee's disclosure to use the management server to make the determination as to whether the building was occupied or unoccupied, and to control the HVAC system accordingly, given

Rhee's disclosure that the management server stored the energy profile, which governed, in part, the determination of occupancy, and was responsible for managing (*e.g.*, controlling) the HVAC systems for the building.

95. Alternatively, it would have been obvious to combine the teachings of Kates with Rhee to teach the limitations of element 1[h]. Rhee disclosed that its management server maintained occupancy modes based on a schedule or occupancy sensors. Kates provided more detailed disclosure concerning the use of occupancy sensors. Specifically, Kates taught an embodiment that included "an occupant sensor" which could be "an infrared sensor, motion sensor, ultrasonic sensor, etc.". Ex. D at 10:18-24. This sensor "senses whether the zone is occupied". *Id.* A "zone" is an area of a building conditioned by an HVAC system. *Id.* at 1:17-34. Kates then taught that a "central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied". *Id.* at 10:31-33. Thus, Kates taught a central computer system that, upon determining a structure was occupied or unoccupied based on the use of an occupant sensor, controlled the HVAC system setpoint to provide heating or cooling at a specified temperature. This teaching is readily applicable to Rhee's management server and motion sensor. Given Rhee's teachings of its management server receiving data from sensors, including a motion detector, and determining occupancy based on an occupancy sensor, it

would have been obvious to combine Rhee with Kates' teaching of using a motion sensor to determine occupancy and to control the HVAC system based on that determination. Rhee in view of Kates would have accordingly rendered element I[h] obvious.

Element 1[i]

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;

96. In my opinion, Rhee teaches element I[i] of claim 1.

97. As I explained above, Rhee disclosed a management server with one or more processors, any of which is a "first processor". Further, Rhee disclosed a "storage module" such as "a secured SQL database" used by the management server to store data including the energy profile and energy data. Ex. C at [0060]. A POSITA would appreciate that an SQL database would comprise memory for storage of the data. Rhee further disclosed that the storage module "can be located remotely from the management server". *Id.* at [0070].

98. A POSITA would have appreciated from Rhee's disclosure that the management server would not be electrically connected to a remotely located SQL database, as each would run on separate machines with independent electrical circuitry and power supplies.

99. The processors of the management server would communicate remotely with the SQL database. *Id.* at [0070]. Thus Rhee disclosed a first processor in the management server which was located remotely from the memory in the storage module, and was not electrically connected to that memory.

100. It would also have been obvious to a POSITA to have a first processor in one computer that was remote from, and not electrically connected to, a memory in a second computer, where the processor communicated remotely with that memory, because such client-server configurations were well known in the art (as Rhee disclosed). *Id.* at [0111].

Element 1[j]

the first processor with circuitry and code designed to execute instructions to communicate with the memory;

101. In my opinion, Rhee teaches element 1[j] of claim 1.

102. As I explained above, the management server was implemented as one or more computers containing at least a first processor, memory for storage of instructions and data, along with circuitry. Ex. C at [0104]-[0107]. Rhee also disclosed that the management server included a storage module, which stored energy data utilizing a database (*e.g.*, a secured SQL database). *Id.* at [0070]. Databases, including SQL databases, were well known in the art, and it would have been obvious to a POSITA that such databases comprise “memory”.

103. Rhee disclosed that the database (*i.e.*, the “memory”) could be remote and accessed by the management server, which a POSITA would understand involves the circuitry and code of the processor executing instructions to do so. Ex. C at [0070].

104. Thus, Rhee disclosed a management server comprising a first processor with circuitry and code designed to execute instructions to communicate with the memory.

Element I[k]

wherein the memory is configured to store historical values of the first data and second data;

105. In my opinion, Rhee teaches element I[k] of claim 1.

106. As I explained above, the management server received measurements of inside temperature (first data) and outside temperature (second data), which were part of the energy data received by the management server. Rhee disclosed that the storage module of the management server stored the energy data. Ex. C at [0060]. This data was stored over time for use by other components of Rhee’s system, such as displaying a report showing “past indoor and outdoor temperatures”. *Id.* at [0066].

107. A POSITA would have appreciated that the past values for the indoor and outdoor temperature stored in the storage module were “historical values”.

108. Thus, Rhee disclosed a storage module containing memory that stored historical values of a first data (inside temperature measurements) and second data (outside temperature measurements).

Claim 2

2. The system of claim 1, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.

109. Claim 2 of the '382 Patent depends from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 2.

110. As explained with respect to claim 1, the system of Rhee was able to determine that the building was unoccupied based on a schedule or occupancy sensor. Rhee further disclosed that the system could control the HVAC system to implement a setpoint corresponding to a desired temperature when the building is unoccupied based on the determination that the building is unoccupied. Ex. C at Table 2; [0052]. As explained above, the system controlled the temperature of the building based on whether the building was unoccupied and the desired “unoccupied” temperatures specified in the energy profile.

111. Thus, Rhee disclosed using an energy profile to implement a setpoint based on the determination that the building was unoccupied—in other words,

wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.

Claim 3

3. The system of claim 1, wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.

112. Claim 3 of the '382 Patent depends from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 3.

113. As explained with respect to claim 1, the system of Rhee was able to determine that the building was occupied based on a schedule or occupancy sensor. Rhee further disclosed that the system could control the HVAC system to implement a setpoint corresponding to a desired temperature when the building is occupied based on the determination that the building is occupied. Ex. C at Table 2; [0052]. As explained above, the system controlled the temperature of the building based on whether the building was occupied and the desired “occupied” temperatures specified in the energy profile.

114. Thus, Rhee disclosed using an energy profile to implement a setpoint based on the determination that the building was occupied—in other words, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.

Claim 4

4. The system of claim 2, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

115. Claim 4 of the '382 Patent depends directly from claim 2 and indirectly from claim 1. As I explained above, Rhee disclosed all of the elements of claims 1 and 2. In my opinion, Rhee also taught the dependent limitations of claim 4.

116. Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the inside temperature of the building. *Id.* at [0057]; [0016]; [0040]; [0042]. Figure 4 of Rhee illustrates how the inside temperature of the building (as well as other characteristics of the building) was measured using a temperature sensor and transmitted via a wireless gateway to the management server. *Id.* at [0074]-[0075];

[0079]. It would have been apparent to a POSITA from Rhee’s disclosures that the first data received by the management server included the current inside temperature measured by a temperature sensor in the building, as well as other characteristics of the building.

117. Thus, Rhee disclosed the management server receiving inside temperature measured by a sensor—in other words, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

Claim 5

5. The system of claim 2, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

118. Claim 5 of the ’382 Patent depends directly from claim 2 and indirectly from claim 1. As I explained above, Rhee disclosed all of the elements of claims 1 and 2. In my opinion, Rhee also taught the dependent limitations of claim 5.

119. Rhee disclosed that the wireless controller at the building transmitted “energy data” to the management server. Ex. C at [0047]-[0048]. This energy data included “environmental data”, which included measurements of the temperature outside the building. *Id.* at [0057]; [0016]; [0040]; [0042]. The management server received this data from a connection to the “internet” (which was a

network). *Id.* at [0040]; [0045]. Rhee further disclosed that the outside temperature was measured by a temperature sensor “placed outside of the building”. *Id.* at [0079]; *see also id.* at [0067]. It would have been apparent to a POSITA from Rhee’s disclosures that the second data received by the management server via its Internet connection included outside temperature measurements collected by a temperature sensor outside of and hence external to the building.

120. Thus, Rhee disclosed the management server receiving outside temperature via the Internet—in other words, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

Claim 6

6. The system of claim 4, wherein the one or more processors with circuitry and code designed to execute instructions queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

121. Claim 6 of the ’382 Patent depends directly from claim 4 and indirectly from claims 1 and 2. As I explained above, Rhee disclosed all of the elements of claims 1, 2, and 4. In my opinion, Rhee also taught the dependent limitations of claim 6.

122. As I discussed with respect to claim 1, Rhee disclosed that the system could be configured to implement specific temperature setpoints based on certain triggers, including whether based on the determination of whether the building is occupied or unoccupied. These setpoints based on occupancy triggered were set in

accordance with the energy profile. *See generally* Ex. C at Table 8; [0097]. After these setpoints were triggered in accordance with the energy profile, users could override them and set different setpoints if they chose to do so. *Id.* at [0085].

Rhee therefore disclosed allowing users to change to a different temperature setpoint after the system determined that the building was occupied or unoccupied. Moreover, Rhee disclosed querying the user whether to confirm a setpoint change. *Id.* at [0078].

123. Therefore, Rhee disclosed each step in the claimed sequence of events: (1) determine whether the building is occupied or unoccupied; (2) query the user to confirm whether to change to a different setpoint. I note that this claim expressly does not require that the query to the user is *based on* the occupancy determination—it simply claims a sequence of steps, in which the query to the user comes after the determination of occupancy. Rhee’s step of querying the user meets this limitation. The fact that Rhee also disclosed an *additional* step of checking energy costs does not change that fact.

124. Thus, Rhee disclosed querying the user to confirm a setpoint change after the system had determined whether or not the building was occupied—in other words the one or more processors with circuitry and code designed to execute instruction queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

125. Alternatively, it would have been obvious to modify the system described in Rhee to query the user to confirm any automatic change of temperature setpoint based on occupancy mode, since the change would affect both the user's comfort and their energy costs, and the system's determination of occupancy based on a schedule or occupancy sensor may not always accurately reflect the true occupancy status. Rhee disclosed functionality to query the user to confirm a setpoint change, and also disclosed the ability of a user to override setpoints. *Id.* at [0085] ("The user can override the settings as defined by the energy profile by utilizing the override user control."). It would have been obvious to a POSITA to enable user confirmations as another way for users to override automatic changes to setpoints initiated by Rhee's system.

126. Thus, it would have been obvious to a POSITA that Rhee taught the dependent limitations of claim 6.

Claim 7

7. The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.

127. Claim 7 of the '382 Patent depends from claim 1. As I explained above, Rhee disclosed all of the elements of claims 1. In my opinion, Rhee also taught the dependent limitations of claim 7.

128. Rhee disclosed that the wireless controller of the building receives at least one setting of the HVAC system. For example, Figure 5 shows the wireless controller displaying numerous settings of the HVAC system, including system status (*i.e.*, “on” or “off”), system mode (“occupied” or “unoccupied”), current temperature setpoint, and scheduled setting changes (“Next *Setting* Change at 5:01pm”) (emphasis added). *See also* Ex. C at [0085]-[0086]. A POSITA would recognize that HVAC system status, mode, setpoint, and scheduled changes are settings of the HVAC system.

129. Rhee further discloses that the wireless controller transmits data, including energy data associated with an energy consuming device (*i.e.*, HVAC system) and energy consumption data to the management server. *Id.* at [0054], [0060]-[0063]. This data includes settings for the HVAC system, including at least mode and temperature setpoints. *Id.* at Tables 3 & 4. A POSITA would understand from these disclosures that the management server received settings of the HVAC system, including the temperature setpoint, the mode, and the system status (“on” or “off”). These settings would be needed so that the user could manage the system and the wireless controller using the web-based interface. *Id.* at [0056]. Further, these settings were used by the analysis module to evaluate the energy profile. *Id.* at [0061]-[0063].

130. Further, Rhee disclosed that current and past energy data was used in the management server's analysis module. *Id.* at [0066]. It would have been apparent to a POSITA that the management server processors received energy data including HVAC settings, so that the data could be stored, used in the analysis module, and made available to the user through the client module. Rhee made clear that the energy data transmitted to the server was very broad and could include any type of data associated with building management. *Id.* at [0057].

131. Thus, Rhee disclosed the management server received HVAC settings.

132. Moreover, it would have obvious from Rhee's disclosures for the management server to receive and store settings of the HVAC system, since Rhee disclosed the management server performed analysis of past energy data, and HVAC setting information would be important to performing that analysis. *Id.* at [0066]-[0067].

133. Alternatively, it would have been obvious to combine the teachings of Sullivan with Rhee to teach the dependent limitations of claim 7. Rhee disclosed that the system could be managed by the user using a web-based user interface provided by the client module to the management server. Sullivan, which also taught control of an HVAC system using a web-based user interface, provided a more detailed embodiment of a web-based user interface. Sullivan depicted a web-

based user interface that displayed the operational mode setting of the HVAC system. HVAC operational modes were well known to a POSITA and the commonly available HVAC mode settings were Cooling, Heating, Auto, and Off. As shown below, Sullivan taught that the web-based user interface could display the current mode for an HVAC system, as well as let the user alter the setting. Ex. E at 12:4-11 & Fig. 3C.

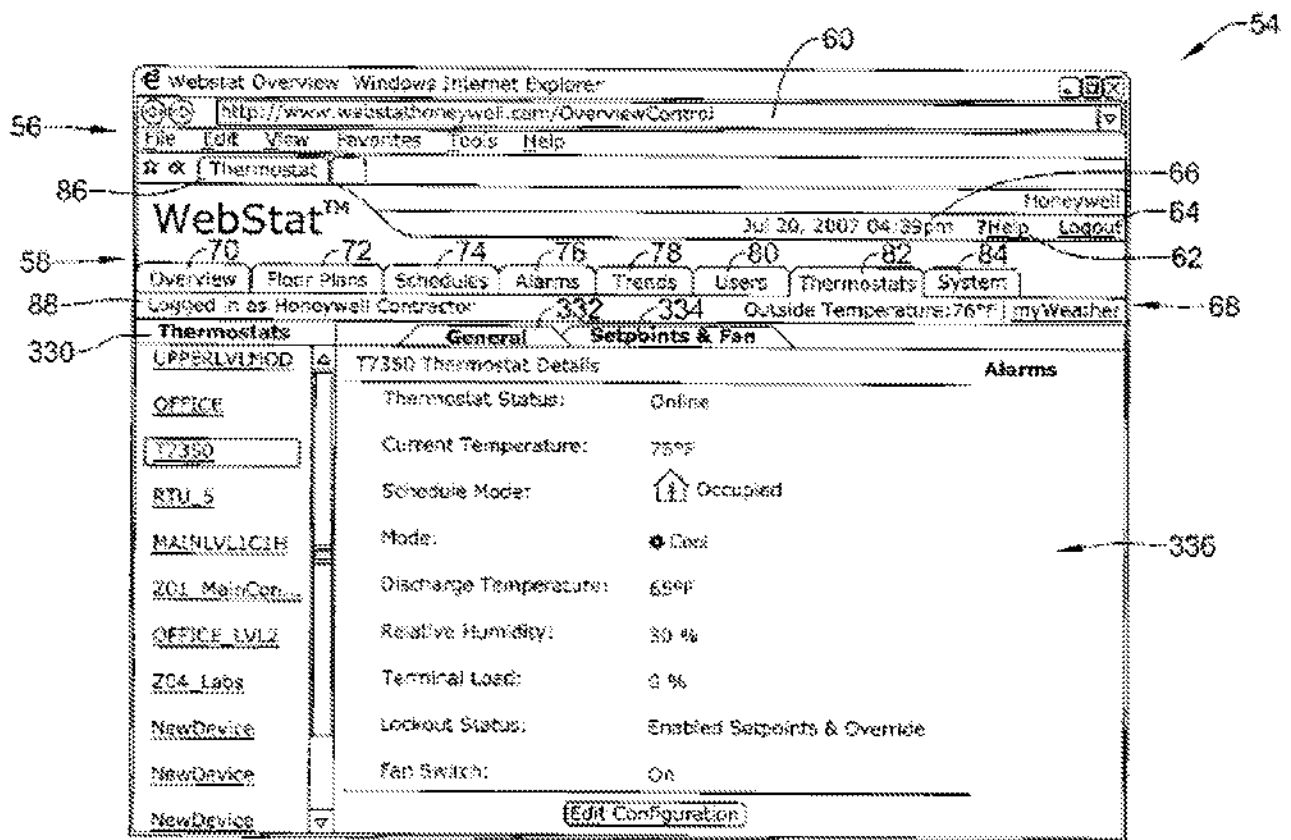


Figure 3C

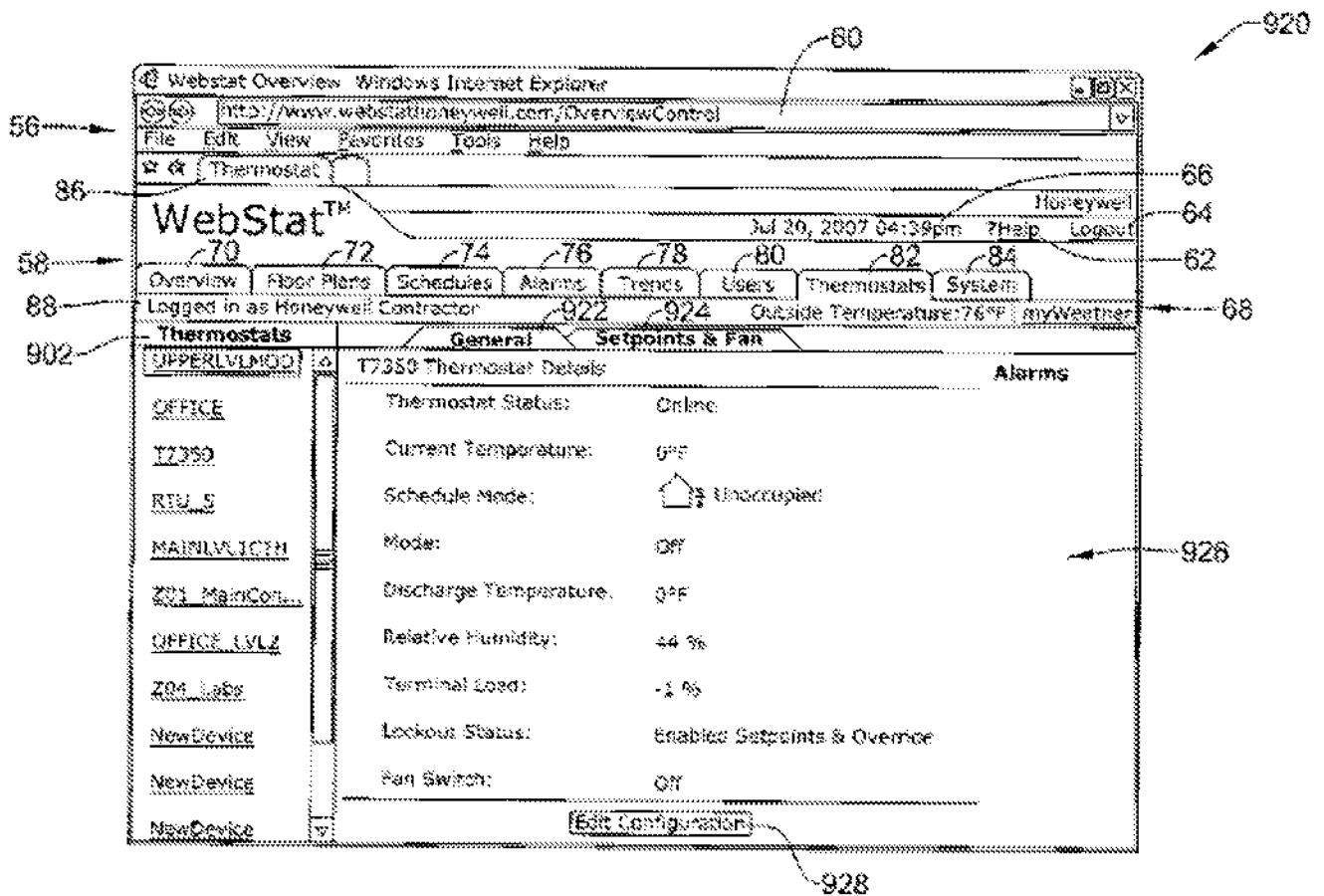


Figure 9B

134. A POSITA would understand the current values of these HVAC settings were reported to the BCA directly or indirectly from an HVAC system, as Sullivan disclosed (*id.* at 7:16-23), and thus were received by the processors in the BCA. Thus, when implementing the user interface of Sullivan in Rhee, the management server's web server would receive the HVAC mode setting in order to display it (by sending this user-specific data to the user's mobile device) or when it is modified (when the user's mobile device would send the new value for the

setting to the management server via the web)). It would have been obvious to modify Rhee to incorporate Sullivan's teachings of allowing users to view and modify settings of an HVAC system, including the HVAC operating mode, given Rhee's teachings of the use of a remote web interface for control of an HVAC system. A POSITA would understand that the processors of the web server receive the settings in order to display them to the user, and in order to allow the user to change them.

Claim 8

8. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.

135. Claim 8 of the '382 Patent depends directly from claim 7 and indirectly from claim 1. As I explained above, Rhee disclosed or rendered obvious all of the elements of claims 1 and 7. In my opinion, Rhee also taught the dependent limitations of claim 8.

136. As I explained with respect to claim 7, Rhee disclosed that the wireless controller of the building receives whether the HVAC system is currently on or off and transmits energy data to the management server, so that a user could manage the system, including the management server and the wireless controller through the client module. For example, Figure 5 shows the wireless controller displaying various settings of the HVAC system, including whether the HVAC system is on or off. *See also* Ex. C at [0085]-[0086] ("As illustrated by the display

device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON)"). A POSITA would have appreciated that the management server could receive the HVAC system's on/off state as reflected in Figure 5.

137. Thus, Rhee disclosed the management server received HVAC settings including the on/off setting.

138. Moreover, it would have obvious from Rhee's disclosures for the management server to receive and store the on/off setting of the HVAC system, since Rhee disclosed the management server performed analysis of past energy data, and HVAC on/off status would be important to performing that analysis. *Id.* at [0066]-[0067].

139. Alternatively, it would have been obvious to combine the teachings of Sullivan with Rhee to teach the dependent limitations of claim 8. Rhee disclosed that the system could be managed by the user using a web-based user interface provided by the client module to the management server. *See, e.g.,* Ex. C at [0045] ("The client module 150 includes an interface utilized to manage the management server 120 directly or remotely via the network 140."). Sullivan, which also taught control of an HVAC system using a web-based user interface, provided a more detailed embodiment of a web-based user interface. Sullivan depicted a web-based

user interface that displayed the operational mode setting of the HVAC system.

See, e.g., Ex. E at 10:14-43 & Fig. 3B, 11:40-51 & Fig. 3C, 21:29-39 & Fig. 9B.

HVAC operational modes were well known to a POSITA and the common

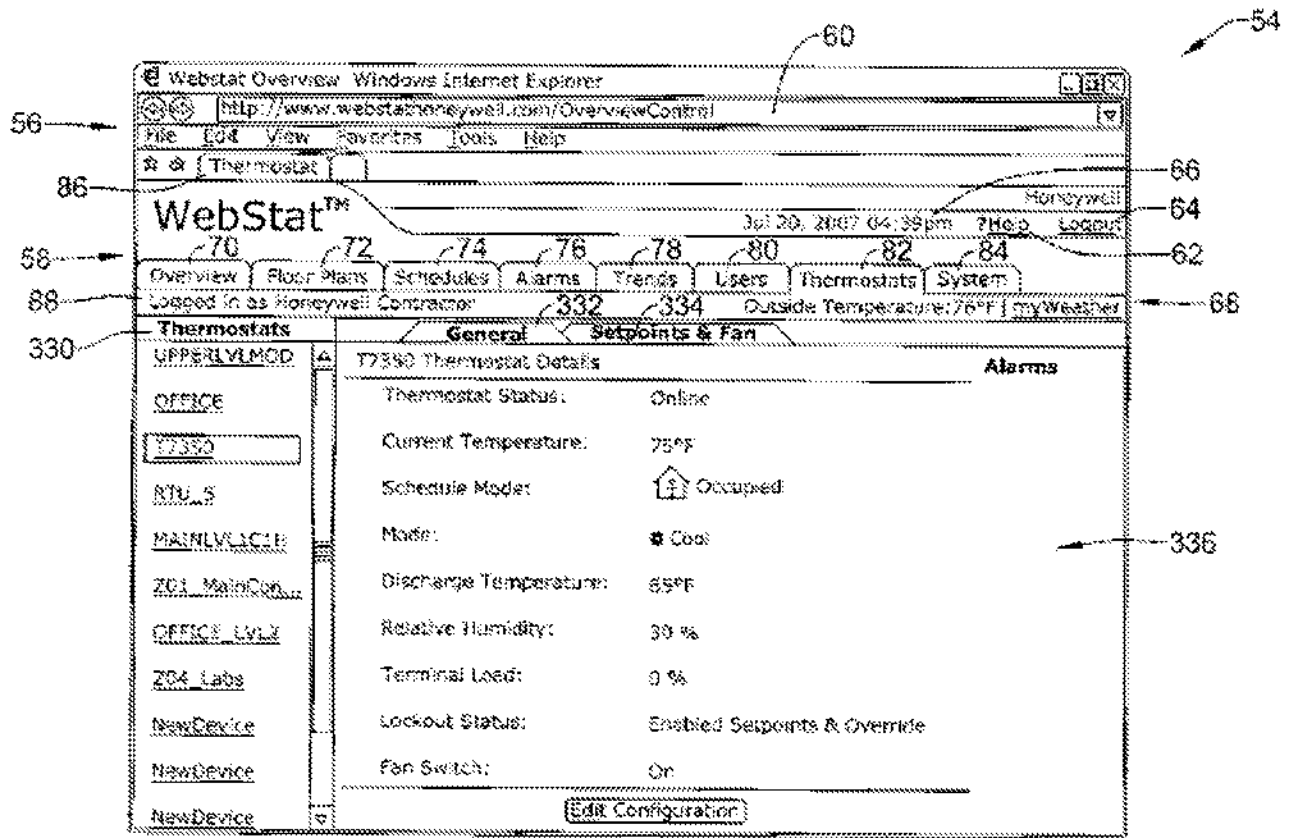
available HVAC mode settings were Cooling, Heating, Auto, and Off. The

“Cooling”, “Heating”, and “Auto” options indicated the HVAC system was on.

The “Off” option indicated the HVAC system was off. As shown below, Sullivan

taught that the web-based user interface could display the current mode for an

HVAC system.



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Figure 3C

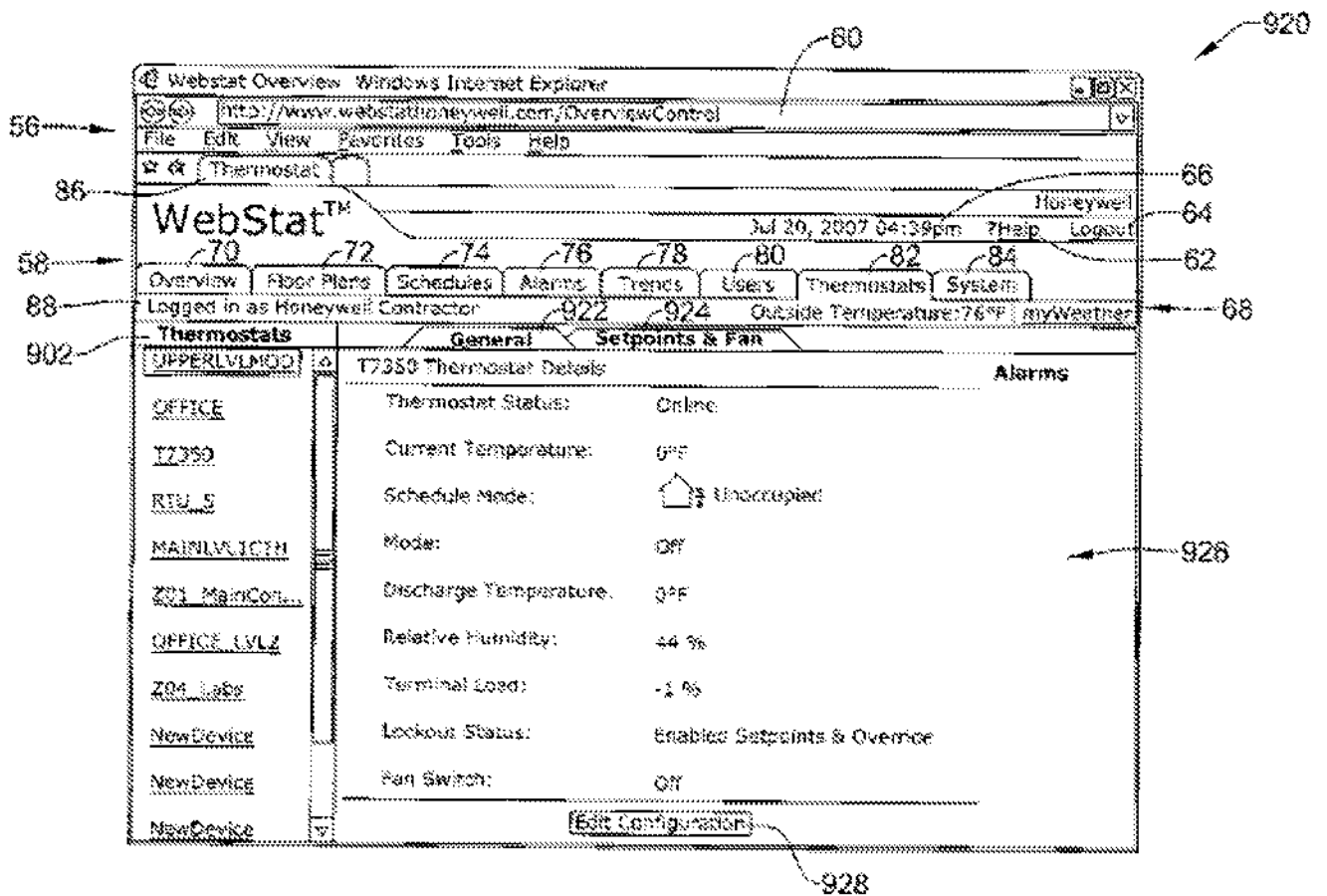


Figure 9B

140. Additionally, Figure 3D shows a pull-down menu 348 that serves as a “system switch” to alter a setting such as “[a]uto, cool, heat, and the like”. *Id.* at 12:4-11. As shown in Figures 3C and 9B, those settings included “off”. Thus, a POSITA would have appreciated that Sullivan disclosed a system that received an HVAC setting of “on” or “off”.

141. A POSITA would understand that the web server would necessarily receive the current setting of whether the HVAC system was off, or operating in a

heating, cooling or automatic mode, in order to display the mode in its user interface. Thus, when implementing the user interface of Sullivan in Rhee, the management server's web server would receive the HVAC mode setting in order to display it (by sending this user-specific data to the user's mobile device) or when it is modified (when the user's mobile device would send the new value for the setting to the management server via the web). It would have been obvious to modify Rhee to incorporate Sullivan's teachings of allowing users to view and modify the on/off setting of an HVAC system, given Rhee's teachings of the use of a remote web interface for control of an HVAC system. A POSITA would understand that the processors of the web server would receive a setting indicating whether the HVAC system was on or off, in order to display the setting to the user and to allow the user to change the setting.

Claim 9

9. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.

142. Claim 9 of the '382 Patent depends directly from claim 7 and indirectly from claim 1. As I explained above, Rhee disclosed all of the elements of claims 1 and 7. In my opinion, Rhee also taught the dependent limitations of claim 9.

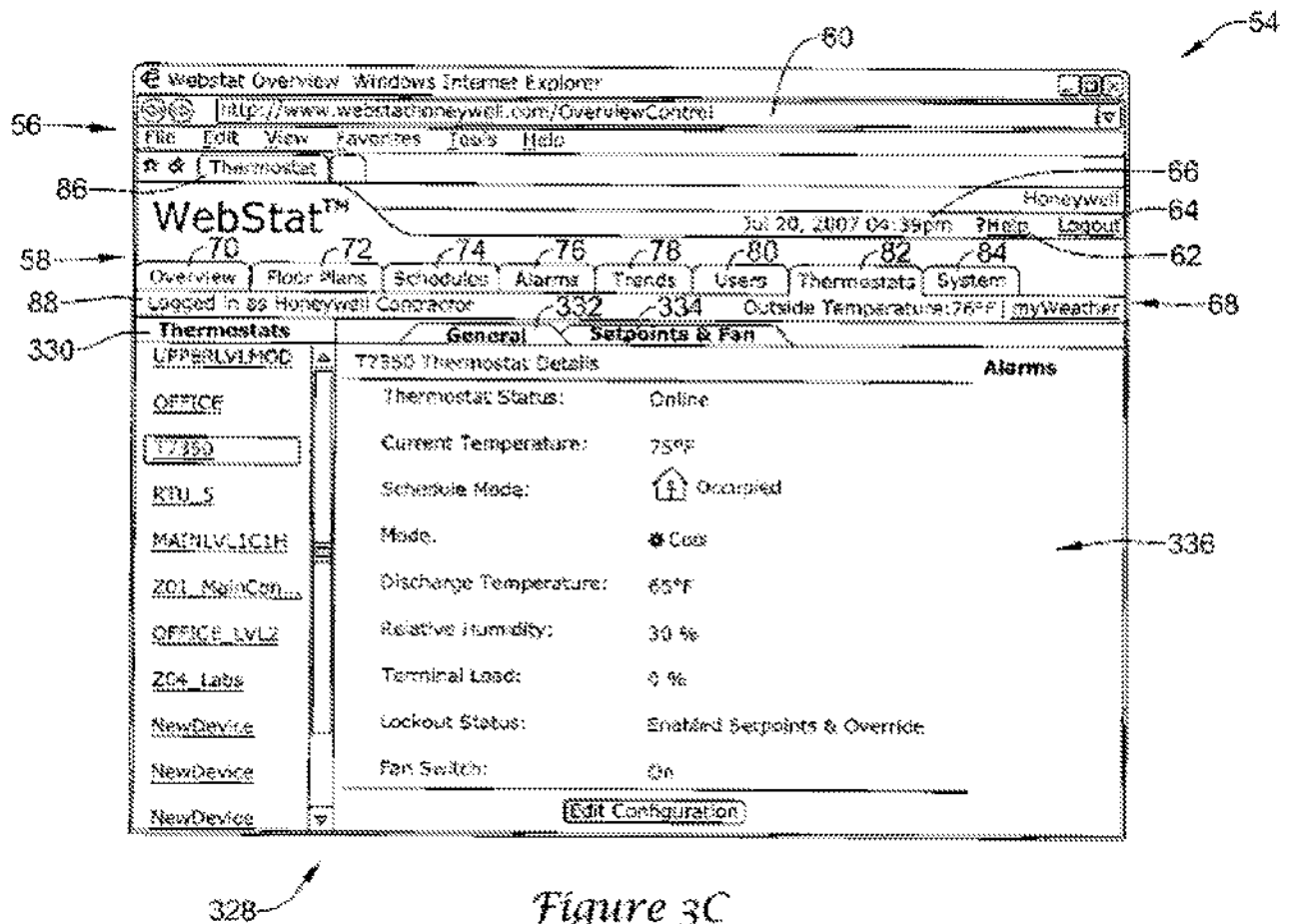
143. Rhee disclosed that the system will “transition” the HVAC system “from heating to cooling” based on the schedule, outside temperature, weather forecast, and other triggers. Ex. C at Table 8. A POSITA would have therefore understood that the management server manages the HVAC system’s mode (heating or cooling) as part of the energy profile, including through a schedule.

144. A POSITA would have further appreciated that the management server and client module would also receive the setting, so that a user could manage the system (using the energy profile), including the management server and the wireless controller through the client module.

145. Thus, Rhee disclosed the management server received heating and cooling settings for an HVAC system.

146. Alternatively, it would have been obvious to combine the teachings of Sullivan with Rhee to teach the dependent limitations of claim 9. Rhee disclosed that the system could be managed by the user using a web-based user interface provided by the client module to the management server. Sullivan, which also taught control of an HVAC system using a web-based user interface, provided a more detailed embodiment of a web-based user interface. Sullivan depicted a web-based user interface that displayed the operational mode setting of the HVAC system. HVAC operational modes were well known to a POSITA and the commonly available HVAC mode settings were Cooling, Heating, Auto, and Off.

As shown below, Sullivan taught that the web-based user interface could display the current mode for an HVAC system, as well as let the user alter the setting. Ex. E at 12:4-11 & Fig. 3D.



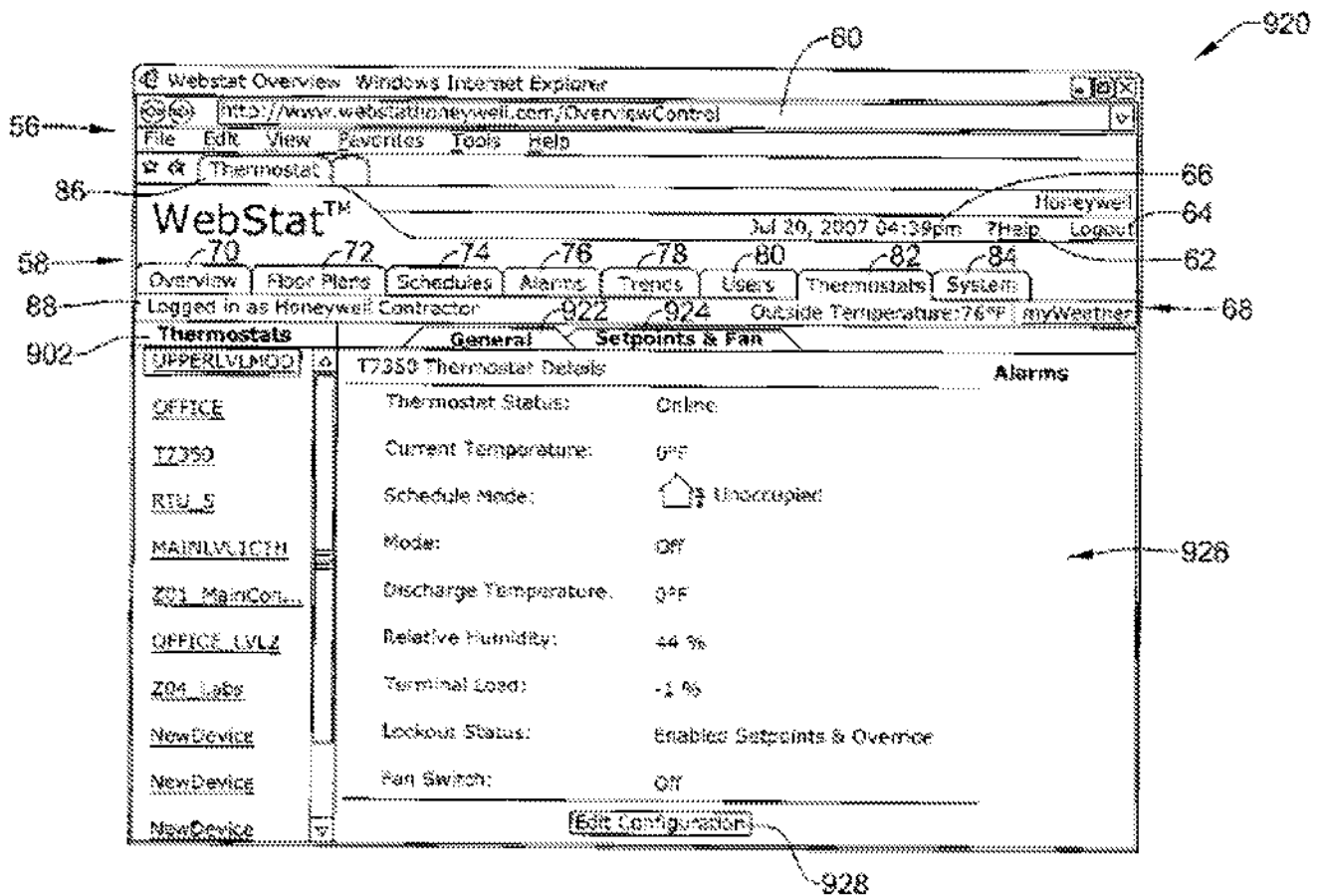


Figure 9B

147. Sullivan displayed the mode of the HVAC system which, as a POSITA would appreciate would indicate if the HVAC system was currently operating in a cooling mode or a heating mode: “Setpoints column 306 may include one or more icons for each thermostat, indicating the operational status of corresponding HVAC equipment. For example, a snowflake icon may be displayed if air conditioning equipment is operating, or perhaps a flame icon may be displayed if heating equipment is operating.” Ex. E at 10:50-59.

148. A POSITA would understand that the web server would receive the setting of whether the HVAC system was off, or operating in a heating, cooling or automatic mode, in order to display the mode in its user interface, and in order to receive modifications from the user. Sullivan also disclosed the use of icons to indicate heating or cooling mode. Ex. E at 10:50-59. Thus, when implementing the user interface of Sullivan in Rhee, the management server's web server would receive the HVAC mode setting in order to display it (by sending this user-specific data to the user's mobile device) or when it is modified (when the user's mobile device would send the new value for the setting to the management server via the web). It would have been obvious to combine Sullivan's HVAC control interface with Rhee's web interface to allow users to view the current HVAC mode and modify it, and so effectuate Rhee's teachings that a user could control the system through the web-based user interface of the client module. A POSITA would understand that the processors of the web server would receive a setting indicating whether the HVAC system was in heating or cooling mode, in order to display the setting to the user and to allow the user to change the setting.

Claim 10

10. The system of claim 4, wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.

149. Claim 10 of the '382 Patent depends directly from claim 4, and indirectly from claims 2 and 1. As I explained above, Rhee disclosed all of the elements of claims 1, 2 and 4. In my opinion, Rhee also taught the dependent limitations of claim 10.

150. Rhee disclosed a management server that received data from a wireless controller. Ex. C at [0048]. The wireless controller can be connected to any number of sensors or alarms, including “a motion detector”. *Id.* at [0083] & Fig. 4. This sensor data was transmitted to and received by the management server. *Id.* at [0101].

151. Rhee disclosed several examples in which an occupancy determination is part of the “energy profile”. *E.g., id.* at [0097] & Table 8. An “energy profile” may utilize different “operational modes”, including an “occupied” and “unoccupied modes”, both of which can be triggered by “occupancy sensors”. *Id.*

152. A POSITA would have understood the “occupancy sensors” to refer at least to the wireless motion sensors. The motion sensor data received by the management server was the claimed “third data”. It would have been apparent to a POSITA from Rhee’s disclosures that the management server received motion sensor data to determine the occupancy of a building or structure. *See id.* at [0083]

(sensor can include motion detector); [0101] (sensor data was transmitted to and received by the management server).

153. Thus, Rhee disclosed the determination of whether the building was occupied or unoccupied based on data received from a motion sensor.

154. Alternatively, it would have been obvious to combine the teachings of Kates with Rhee to teach the dependent limitations of claim 10. Rhee disclosed that its management server maintained occupancy modes based on occupancy sensors. Kates provided more detailed disclosure concerning the use of occupancy sensors. Specifically, Kates taught an embodiment that includes “an occupant sensor” which can be a “motion sensor”. Ex. D at 10:19-21. This sensor “senses whether the zone is occupied”. *Id.* A “zone” is an area of a building conditioned by an HVAC system. Kates then taught that a “central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied”. *Id.* at 10:28-33. Thus, Kates taught a central computer system that, upon determining a structure is occupied or unoccupied based on the use of an occupant sensor, controlled the HVAC system setpoint to provide heating or cooling at a specified temperature. This teaching is readily applicable to Rhee’s management server and motion sensor. Rhee in view of Kates would have accordingly rendered claim 10 obvious.

Claim 11

11. The system of claim 1, wherein the network connection is based on the IEEE 802.11 wireless protocol.

155. Claim 11 of the '382 Patent depends directly from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 11.

156. Rhee disclosed that “the components of the system can be interconnected by” communication networks, which may include a “802.11” network. Ex. C at [0111]-[0112]. A POSITA would have recognized that an “802.11 network” refers to a network connection based on the IEEE 802.11 wireless network protocol.

157. Thus, Rhee disclosed the use of an 802.11 network to connect the various components of the claimed system—in other words, wherein the network connection is based on the IEEE 802.11 wireless protocol.

Claim 12

12. The system of claim 1, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

158. Claim 12 of the '382 Patent depends directly from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 12.

159. Rhee disclosed a management server implemented as one or more computers containing at least a first processor. Ex. C at [0037]-[0038]; [0104]-[0107]. The management server disclosed by Rhee stored an “energy profile”, which utilized different “operational modes”. *Id.* at [0097]. Among those operational modes were “Occupied” and “Unoccupied”. *Id.* at [0097] & Table 8. Rhee disclosed several examples in which an occupancy determination—based on either occupancy sensors or a preprogrammed schedule—would be part of the energy profile. *Id.* at [0052] & Table 2; [0061] & Table 4; [0065] & Table 6; [0097] & Table 8. It would be apparent to a POSITA that the occupancy determination was made at least by the management server.

160. Thus, Rhee disclosed the management server determining whether a building should be subject to the “occupied” or “unoccupied” operational mode—in other words, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

161. It would also have been obvious to a POSITA from Rhee’s disclosure to use the management server to make the determination as to whether the building was occupied or unoccupied, and to control the HVAC system accordingly, given Rhee’s disclosure that the management server stored the energy profile which governed the determination of occupancy and was responsible for managing (*e.g.*, controlling) the HVAC systems for the building.

162. Alternatively, it would have been obvious to combine the teachings of Kates with Rhee to obtain the dependent limitations of claim 12. Rhee disclosed that its management server maintained occupancy modes based on a schedule or occupancy sensors. Kates teaches that a “central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied”. Ex. D at 10:28-33. Thus, Kates taught a central computer system that, upon determining a structure is occupied or unoccupied controlled the HVAC system setpoint to provide heating or cooling at a specified temperature. This teaching is readily applicable to Rhee’s management server and motion sensor. Rhee in view of Kates would have accordingly rendered claim 12 obvious.

Claim 13

13. The system of claim 1, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

163. Claim 13 of the ’382 Patent depends directly from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 13.

164. Rhee disclosed a management server that was implemented as one or more computers containing at least a first processor. Ex. C at [0037]-[0038]; [0104]-[0107]. Rhee also disclosed a client module that provided a user interface

for managing the management server. *Id.* at [0056]. The client module allowed the user to adjust the temperature setpoints that were stored in the energy profile. *Id.* Rhee further disclosed that temperature setpoints determined whether the HVAC system was “on” or “off”. *Id.* at [0085]-[0086] (“As illustrated by the display device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON).”).

165. Thus, Rhee disclosed the management server controlling the HVAC’s provision of heat or cool—in other words, the system of claim 1, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

166. It would also have been obvious to a POSITA from Rhee’s disclosure to use the management server to control the HVAC system’s provision of heating or cooling to the building, given Rhee’s disclosure that the management server stored the energy profile which governed the settings for the HVAC systems in the building depending on occupancy mode.

167. Alternatively, it would have been obvious to combine the teachings of Kates with Rhee to obtain the dependent limitations of claim 13. Rhee disclosed that its management server maintained occupancy modes based on a schedule or occupancy sensors. Kates teaches that a “central system 710, 810, 910 changes the

temperature setpoints of the various zones according to whether the composite zone is empty or occupied”. Ex. D at 10:28-33. Thus, Kates taught a central computer system that, upon determining a structure is occupied or unoccupied controlled the HVAC system setpoint to provide heating or cooling at a specified temperature. This teaching is readily applicable to Rhee’s management server and motion sensor. Rhee in view of Kates would have accordingly rendered claim 13 obvious.

Claim 14

14. The system of claim 1, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

168. Claim 14 of the ’382 Patent depends directly from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 14.

169. Rhee disclosed a system that included “a wireless controller” and a “wireless sensor”. The wireless controller and wireless sensor were connected to one another, and to various other components of the system, by a “wireless mesh network”. Ex. C at [0040]. A POSITA would have understood that sensor data communicated over this wireless mesh network was provided by a sensor that is “not electrically connected to the first processor”, because the wireless sensor was not physically connected to the management server.

170. Thus, Rhee disclosed the management server receiving inside temperature data from a sensor that was not electrically connected to the management server—in other words, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

Claim 15

15. The system of claim 7, wherein the interface is configured to allow the user to turn the HVAC system on or off.

171. Claim 15 of the '382 Patent depends directly from claim 7, and indirectly from claim 1. As I explained above, Rhee disclosed all of the elements of claims 7 and 1. In my opinion, Rhee also taught the dependent limitations of claim 15.

172. Rhee disclosed the management server received commands from the client module. Rhee also disclosed that the user—when using the client module—could “control the system” in various ways, including by adjusting temperature setpoints and schedules. Ex. C at [0056]. Rhee further disclosed that temperature setpoints determined whether the HVAC system was “on” or “off”. *Id.* at [0085]-[0086] (“As illustrated by the display device 512, the set temperature for the controller based on the Occupied mode is 73 degrees. However the current temperature is 79 degrees. As such, the HVAC system is currently activated (i.e., ON).”).

173. A POSITA would have understood that the user could turn the HVAC system on or off at least by adjusting the temperature setpoints in the energy profile, using the client module's interface. It would also have been obvious that Rhee disclosed an interface configured to allow the user to turn the HVAC system on or off. Rhee disclosed that "wireless controller 510" provided "thermostat functions", which as understood by a POSITA would conventionally have included an on/off functionality. *Id.* at [0085]. Rhee also disclosed that "existing thermostat devices" could be utilized. *Id.* A POSITA would have known that such "existing thermostat devices" conventionally included on/off functionality.

174. Thus, Rhee disclosed an interface that allowed the user to turn the HVAC system on or off.

175. Alternatively, it would have been obvious to combine the teachings of Sullivan with Rhee to teach the dependent limitations of claim 15. Rhee disclosed that the system could be managed by the user using a web-based user interface provided by the client module to the management server. Sullivan, which also taught control of an HVAC system using a web-based user interface, provided a more detailed embodiment of a web-based user interface. Sullivan depicted a web-based user interface that displayed the operational mode setting of the HVAC system. HVAC operational modes were well known to a POSITA and the common available HVAC mode settings were Cooling, Heating, Auto, and Off. As

shown below, Sullivan taught that the web-based user interface could use the web-based user interface to change whether the system was off or on (i.e., in cooling, heating or auto mode). Ex. E at 12:4-11 & Fig. 3D.

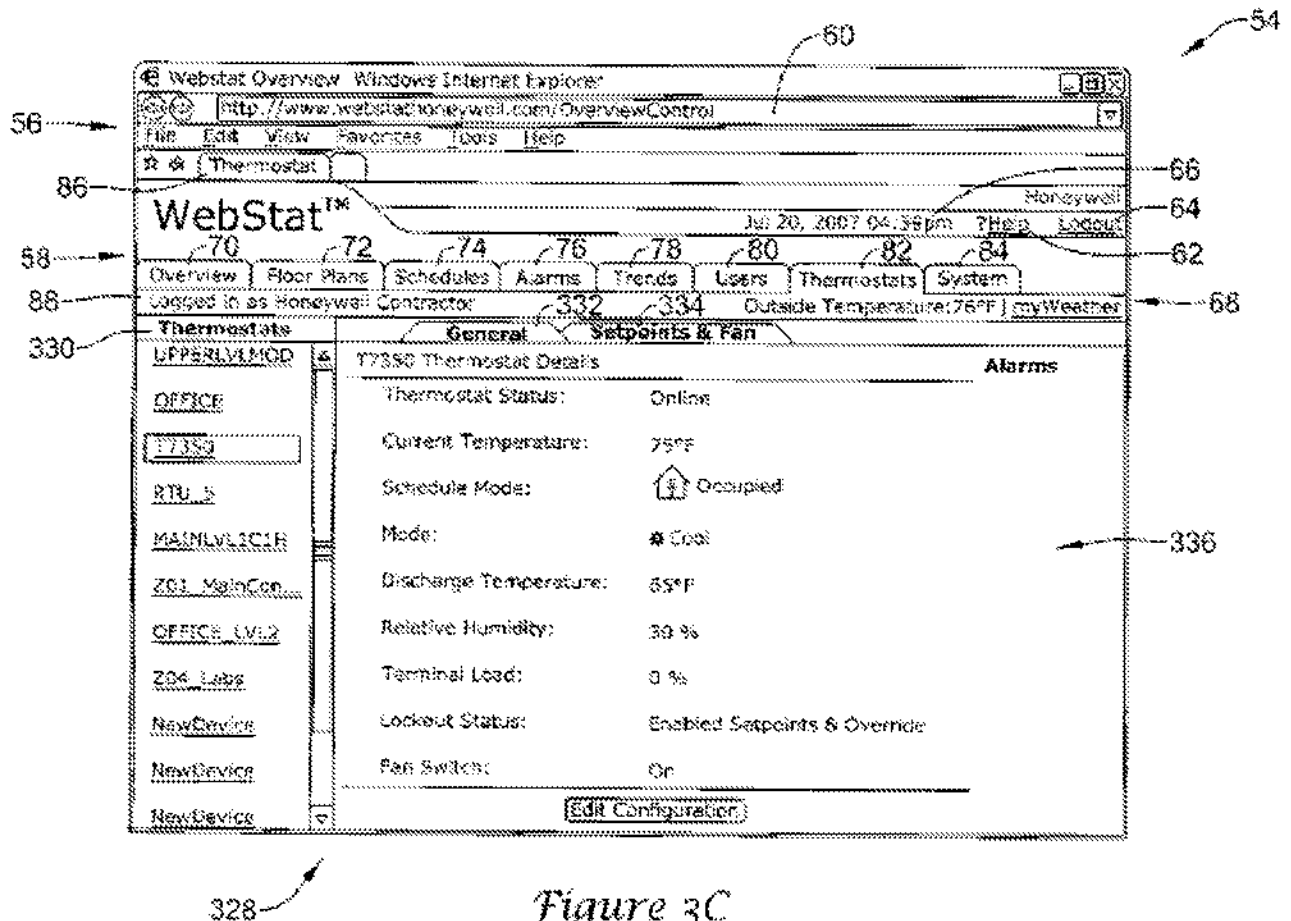


Figure 3C

176. Figure 3D shows a pull-down menu 348 that serves as a “system switch” to alter a setting such as “[a]uto, cool, heat, and the like”. *Id.* at 12:4-11. As shown in Figures 3C and 9B, those settings included “off”. Thus, a POSITA would have appreciated that Sullivan disclosed a system in which a interface was configured to allow the user turn the HVAC system of “on” or “off”.

177. A POSITA would understand that the HVAC system could be turned on or off by adjusting the system switch between “off” (meaning the HVAC system is to be turned off, or “Auto”, “Cool” or “Heat” (meaning the HVAC system is to be turned on).

178. It would have been obvious to modify Rhee to incorporate Sullivan’s teachings of allowing users to modify the on/off setting of an HVAC system through the client module’s web interface, given Rhee’s teachings that the user can control the system through its web interface, and the fact that turning an HVAC on or off was basic functionality in any HVAC control system.

Claim 16

16. The system of claim 7, wherein the interface is configured to allow the user to input that the building is currently unoccupied.

179. Claim 16 of the ’382 Patent depends directly from claim 7, and indirectly from claim 1. As I explained above, Rhee disclosed all of the elements of claims 7 and 1. In my opinion, Rhee also taught the dependent limitations of claim 16.

180. Rhee disclosed the management server received commands from the client module. Rhee also disclosed that the user—when using the client module—could “control the system” in various ways, including by adjusting temperature setpoints and schedules. Ex. C at [0056].

181. Moreover, Rhee disclosed that “occupied” and “unoccupied” modes can be triggered by schedules. *Id.* at Table 8. Therefore, a POSITA would have understood that being able to modify schedules meant the client module was configured to permit a user to input that the building was currently unoccupied. For instance, it would have been obvious to a POSITA that a user could set their schedule so as to trigger the “occupied” mode for as long as the user is occupying the building.

182. It would also have also been obvious that the ability to “control” the system included the ability to input that the building was currently unoccupied.

183. Rhee further disclosed an “override” function whereby the user can override the settings defined by the energy profile by utilizing the override user control. *Id.* at [0085]. The override function allowed users to temporarily interrupt or alter the operational modes. As I explained earlier, “occupied” and “unoccupied” were two of the operational modes. *Id.* at [0097] & Table 8.

184. It would have been apparent to a POSITA that the override control functionality would allow the user to input that the building was currently unoccupied.

185. Thus, Rhee disclosed an interface that allowed the user to specify the current occupancy status was unoccupied.

186. Alternatively, it would have been obvious to combine the teachings of Sullivan with Rhee to teach the dependent limitations of claim 16. Rhee disclosed that the system could be managed by the user using a web-based user interface provided by the client module to the management server. It further disclosed that the user could alter the occupancy mode by overriding them. Sullivan, which also taught control of an HVAC system using a web-based user interface, provided a more detailed embodiment of a web-based user interface. Sullivan depicted a web-based user interface that allowed the user to input the system was unoccupied, as shown below.

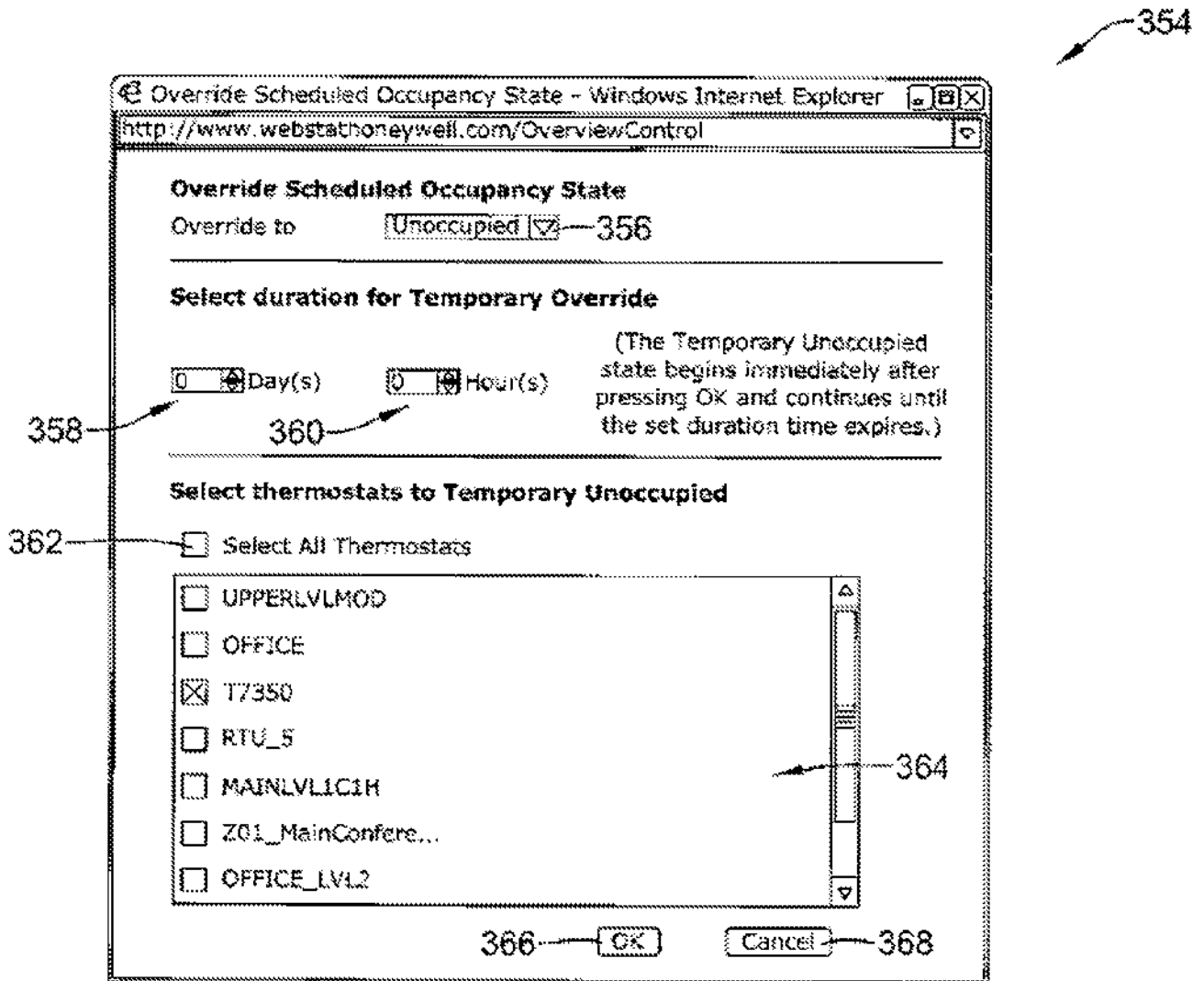


Figure 3E

187. As Sullivan explained, using this interface “if the current status is occupied, a user may override the current status by changing it to unoccupied.” Ex. E at 12:18-30. It would have been obvious to combine Sullivan’s teaching of allowing a user to input that the system is currently unoccupied via a web page with Rhee’s web interface to allow for remote control of the HVAC system.

Claim 17

The Preamble

17. *A system for controlling an HVAC system, comprising:*

188. To the extent that the preamble is limiting, Rhee taught element 17[pre] of claim 17 for the reasons that Rhee taught element 1[pre] of claim 1.

Element 17[a]

a memory;

189. In my opinion, Rhee taught element 17[a] of claim 17 for the same reasons that Rhee taught element 1[a] of claim 1.

Element 17[b]

one or more processors with circuitry and code designed to execute instructions;

190. In my opinion, Rhee taught element 17[b] of claim 17 for the same reasons that Rhee taught element 1[b] of claim 1.

Element 17[c]

the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;

191. In my opinion, Rhee taught element 17[c] of claim 17 for the same reasons that Rhee taught element 1[a] of claim 1 and claim 4.

Element 17[d]

the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature, wherein the second data from the network connection is received via the Internet;

192. In my opinion, Rhee taught element 17[d] of claim 17 for the same reasons that Rhee taught element 1[a] of claim 1 and claim 5.

Element 17[e]

the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

193. In my opinion, Rhee taught element 17[e] of claim 17 for the same reasons that Rhee taught element 1[e] of claim 1.

Element 17[f]

the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

194. In my opinion, Rhee taught element 17[f] of claim 17 for the same reasons that Rhee taught element 1[f] of claim 1.

Element 17[g]

the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet.

wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface via on mobile, wireless device running software application code via the Internet;

195. In my opinion, Rhee taught element 17[g] of claim 17 for the same reasons that Rhee taught element 1[g] of claim 1.

Element 17[h]

the one or more processors with circuitry and code designed to execute instructions to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;

196. In my opinion, Rhee taught element 17[h] of claim 17 for the same reasons that Rhee taught element 1[h] of claim 1 and claim 10.

Element 17[i]

the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied;

197. In my opinion, Rhee taught element 17[i] of claim 17.

198. Rhee disclosed a management server that communicates with a wireless controller; the controller manages at least one energy device based on one or more parts of an energy profile. Ex. C at [0047]-[0048]. The system's energy profile may include an HVAC energy profile, which in turn includes

predetermined target temperatures (with permissible ranges) contingent on factors, including the operational mode. *Id.* at [0052] & Table 2. Rhee further disclosed operational modes including “occupied” and “unoccupied”, which may be triggered by, among other things, “occupancy sensors”. *Id.* at [0097] & Table 8. The wireless controller described by Rhee “manages the heating, ventilating, and air conditioning units” based on, among other things, the applicable operational mode and the set temperatures reflected in the energy profile. *Id.* at [0052].

199. A POSITA would have understood from Rhee’s disclosures that the energy management system controlled the HVAC system based on, among other things, a determination that the building was occupied and that, further, the energy management system would induce the HVAC system to provide heating or cooling until the set temperature for the “occupied” mode had been achieved.

200. Rhee thus disclosed that the management server determined when the building was occupied and then used a temperature setpoint to control the HVAC system to provide heating or cooling to reach that setpoint—in other words, the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.

201. It would also have been obvious to a POSITA from Rhee's disclosure to use the management server to make the determination as to whether the building was occupied and when it was, to send commands to alter the HVAC system setpoint to the setpoint corresponding to the occupied mode in the energy profile, given Rhee's disclosure that the management server stored the energy profile which governed the determination of occupancy and was responsible for managing (e.g., controlling) the HVAC systems for the building.

202. Alternatively, it would have been obvious to combine the teachings of Kates with Rhee to teach the limitations of element 17[i]. Rhee disclosed that its management server maintained occupancy modes based on a schedule or occupancy sensors. Kates provided more detailed disclosure concerning the use of occupancy sensors. Specifically, Kates taught an embodiment that included "an occupant sensor" which can be "an infrared sensor, motion sensor, ultrasonic sensor, etc.". Ex. D at 10:18-21. This sensor "senses whether the zone is occupied". *Id.* A "zone" is an area of a building conditioned by an HVAC system. Kates then taught that a "central system 710, 810, 910 changes the temperature setpoints of the various zones according to whether the composite zone is empty or occupied". *Id.* at 10:28-33. Thus, Kates taught a central computer system that, upon determining a structure is occupied based on the use of an occupant sensor, controlled the HVAC system setpoint to provide heating or cooling at a specified

temperature. This teaching is readily applicable to Rhee's management server and motion sensor. Rhee in view of Kates would have accordingly rendered element 17[i] obvious.

Element 17[j]

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;

203. In my opinion, Rhee taught element 17[j] of claim 17 for the same reasons that Rhee taught element 1[i] of claim 1.

Element 17[k]

the first processor with circuitry and code designed to execute instructions to communicate with the memory;

204. In my opinion, Rhee taught element 17[k] of claim 17 for the same reasons that Rhee taught element 1[j] of claim 1.

Element 17[l]

wherein the memory is configured to store historical values of the first data and second data.

205. In my opinion, Rhee taught element 17[l] of claim 17 for the same reasons that Rhee taught element 1[k] of claim 1.

Claim 18

18. The system of claim 17, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

206. Claim 18 of the '382 Patent depends from claim 17. As I explained above, Rhee disclosed all of the elements of claim 17. In my opinion, Rhee also taught the dependent limitations of claim 18.

207. As detailed earlier with respect to claim 14, Rhee disclosed a system that included “a wireless controller” and a “wireless sensor”. The wireless controller and wireless sensor were connected to one another, and to various other components of the system, by a “wireless mesh network”. Ex. C at [0040]. It would have been apparent to a POSITA that Rhee taught a system wherein sensor data provided over the wireless mesh network was transmitted by a sensor “not electrically connected” to the first processor because it used wireless communications.

208. Thus, Rhee disclosed the management server receiving inside temperature data from a sensor that was not electrically connected to the management server—in other words, wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

Claim 19

19. The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

209. Claim 19 of the '382 Patent depends from claim 1. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 19.

210. Rhee disclosed an “analysis module”, enabled to access “energy data” stored on the “storage module” in order to create charts and reports regarding past, present or future energy usage. Ex. C at [0066]. The stored “energy data” included “environmental data” such as temperature inside and outside the building. *Id.* at [0057]. The analysis module integrated the energy data, then used the information to formulate modifications to the energy profile. *Id.* at [0067]. Rhee discloses a “profile module” to implement the modification. *Id.* at [0098]-[0099]; Fig. 7. The profile module both modifies the settings of the energy profile itself *and* transmits the modifications to the wireless controllers. *Id.* at [0099].

211. The “energy data”, described in Figure 7, could include “environmental data”. *Id.* at [0066]. Environmental data, in turn, could include measurements of “outside temperature” and “inside temperature” (among others). *Id.* at [0057]. Thus, Rhee disclosed controlling an HVAC system using energy profiles with operational temperatures based on at least in part historical values. Alternatively, it would have been obvious that Rhee disclosed a system wherein one or more processors controlled the HVAC system to provide heating or cooling

a building to an operational temperature based on historical values of inside and outside temperature.

212. Thus, Rhee disclosed the processors of the management server controlling the HVAC system to heat or cool based on an operational temperature setting based on historical values of inside and outside temperature—in other words, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

Claim 20

20. The system of claim 17, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

213. Claim 20 of the '382 Patent depends from claim 17. As I explained above, Rhee disclosed all of the elements of claim 1. In my opinion, Rhee also taught the dependent limitations of claim 20.

214. Rhee disclosed an “analysis module”, enabled to access “energy data” stored on the “storage module” in order to create charts and reports regarding past, present or future energy usage. Ex. C at [0066]. The stored “energy data” included “environmental data” such as temperature inside and outside the building.

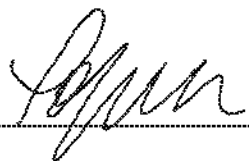
Id. at [0057]. The analysis module integrated the energy data, then used the information to formulate modifications to the energy profile. *Id.* at [0067]. Rhee discloses a “profile module” to implement the modification. *Id.* at [0098]-[0099]. The profile module both modifies the settings of the energy profile itself *and* transmits the modifications to the wireless controllers. *Id.* at [0099].

215. Thus, Rhee disclosed the processors of the management server controlling the HVAC system to heat or cool based on an operational temperature setting based on historical values of inside and outside temperature—in other words, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

X. CONCLUSION

216. I declare under penalty of perjury that the foregoing is true and accurate to the best of my knowledge.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Tajana', written over a horizontal line.

Tajana Šimunić Rosing, Ph.D.

February 12, 2021

ATTACHMENT A

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

INTERESTS energy-efficient computing, embedded systems hardware and software design**PROFESSIONAL EXPERIENCE**05-pres. **UCSD** Full Professor and Frattamico Endowed Chair in the CSE Department; Adjunct Professor in ECE,

08-pres Executive board member of San Diego Supercomputing Center

- leading a diverse research team on projects related to system energy-efficiency:
 - management and optimization of computing systems
 - \$40M JUMP CRISP center focusing on accelerating machine learning workloads
 - head of the Large Scale Systems thrust in MuSyC center: faculty from 11 top USA universities
 - 10 year NSF ERC CIAN: lead of thrust on energy efficient datacenters: 30 companies, 12 universities
 - funded by NSF, DARPA via MARCO-GSRC & FCRP MuSyC, Oracle, CNS, Google, Microsoft, TI, SRC, Cisco, Qualcomm, CEC, Futurewei, Panasonic, Ericson, Broadcom, Intel, IBM,
 - in collaboration with: Google, HP Labs, Oracle, Qualcomm, Broadcom, Cisco, Intel, Texas Instruments, IBM Zurich & TJ Watson, Microsoft, Yahoo, EPFL, ETH, IBM, SDSC, Futurewei, NVidia, AMD.
 - resource management and design of heterogeneous wireless sensor-control-actuator networks
 - director of \$16.3M AI for Healthy Living Center, with faculty from School of Engineering, School of Social Sciences, School of Medicine, Contextual Robotics Institute, Center for Healthy Aging, Center for Microbiome Innovation, Qualcomm Institute & Design Lab
 - \$28M TerraSwarm center: 22 faculty from 10 top institutions in the USA; leading the SmartCities theme
 - led context-aware distributed optimization thrust as a part of ARPA-E NODES grant
 - NSF MetaSense project focused on in-field calibration & NSF CitiSense project focused on mobile air quality sensing: coverage in NY Times and the Wall Street Journal, December 2012
 - funded by DARPA, NSF, NIH, ARPA-E, DOE, LANL, CNS, Intel, IBM, TI, UTC, Raytheon, Oracle, Qualcomm, Panasonic, Huawei, Broadcom, Ericson, Google, Microsoft, and others.
 - In collaboration with: LLNL, LANL, SDG&E, UCSD School of Medicine & Social Sciences, SDSC, University of Bologna, EPFL, ETH, Stanford and other institutions.
- published over 240 publications: got a nomination for one of the best papers in 10 years of DATE, and TODAES journal paper was the top most downloaded paper 2010-2011, received a number of best paper awards and nominations, and numerous invited talks in academia and industry
- led projects as a PI, co-PI or senior personnel totaling more than \$200M
- teaching embedded systems and computer engineering classes

97 – 04 STANFORD UNIVERSITY & HEWLETT-PACKARD LABS

- led a team of researchers developing products for wireless media market, interfaced with HP divisions; 5 patents
- obtained project funding for university collaborations and led collaboration at Stanford

93 – 97 ALTERA CORPORATION

- patented a new testing methodology for FPLDs that enabled Altera to get to market 4 months sooner
- developed, evaluated and managed simulation and testing for 5 product families

92 – 93 UNIVERSITY OF ARIZONA

- design automation of high-speed VLSI interconnects: the simulator has been used by SRC member companies

88 – 92 NORTHERN ARIZONA UNIVERSITY

- modeled tether dynamics for orbiting stations to aid in the design of orbiting telescopes; designed an image processing environment for MRIs; designed an award-winning switched capacitor filter for TI

EDUCATION PhD in Electrical Engineering, Stanford University, 2001, 4.0 GPA.Thesis: *Energy Efficient System Design and Utilization*

MS in Engineering Management, Stanford University, 2000, 4.0 GPA

MS in Electrical and Computer Engineering, University of Arizona, 1993, 4.0 GPA.

BS in Electrical Engineering, Northern Arizona University, 1992, 4.0 GPA.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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56. C. Chan, M. Ostertag, A. S. Akyurek, T. S. Rosing, "Context-Aware System Design," Invited paper to SPIE 2017.
57. B. Aksanli, J. Venkatesh, C. Chan, A. S. Akyurek, T. S. Rosing, "Context-Aware and User-Centric Residential Energy Management," PerIoT, 2017.
58. N. Mousavi, B. Aksanli, A. S. Akyurek, T. S. Rosing, "Accuracy-Resource Tradeoff for Edge Devices in Internet of Things," SmartEdge 2017.
59. W. Cui, Y. Kim, T. S. Rosing, "Cross-Platform Machine Learning Characterization for Task Allocation in IoT Ecosystems," **Best paper award**, IEEE CCWC, 2017.
60. M. Imani, A. Rahimi, D. Kong, T. Rosing, J. M. Rabacay "Exploring Hyperdimensional Associative Memory", HPCA'17.
61. M. Imani, S. Gupta, T. Rosing "Ultra-Efficient Processing In-Memory for Data Intensive Applications", DAC'17.
62. M. Imani, D. Peroni, T. Rosing "CFPU: Configurable Floating Point Multiplier for Energy-Efficient Computing", DAC'17 (Best poster at UCSD's ResearchExpo).
63. Y. Kim, M. Imani, T. Rosing "ORCHARD: Visual Object Recognition Accelerator Based on Approximate In-Memory Processing", ICCAD'17.
64. Mohsen Imani, Yeseong Kim, and Tajana S. Rosing, "Brain-Inspired Hyperdimensional Computing: An Efficient Classifier for Embedded Devices," ICCAD'17.
65. M. Imani, A. Rahimi, D. Kong, T. Rosing, J. M. Rabacay "Hardware Acceleration of Brain-inspired Hyperdimensional Computing", ICCAD VMC 2017.
66. M. Imani, D. Peroni, Y. Kim, A. Rahimi and T. Rosing, "Efficient Neural Network Acceleration on GPGPU using Content Addressable Memory," DATE'17.
67. M. Samragh, M. Imani, F. Koushanfar and T. Rosing, "LookNN: Neural Network with No Multiplication," DATE'17.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

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68. M. Imani, S. Gupta, A. Arredondo, T. Rosing "Efficient Query Processing in Crossbar Memory", ISLPED'17.
69. M. Imani, Y. Kim, T. Rosing, "MPIM: Multi-Purpose In-Memory Processing using Configurable Resistive Memory" ASP-DAC'17.
70. M. Imani, D. Kong, A. Rahimi, T. Rosing, "VoiceHD: Hyperdimensional Computing for Efficient Speech Recognition", ICRC'17.
71. M. Imani, Y. Kim, T. Rosing "NNgine: Ultra-Efficient Nearest Neighbor Accelerator Based on In-Memory Computing", ICRC'17.
72. J. Sim, M. Imani, Y. Kim, T. Rosing "Enabling Efficient System Design Using Vertical Nanowire Transistor Current Mode Logic", VLSI-SoC'17.
73. M. Imani, D. Kong, A. Rahimi and T. Rosing, Jan Rabaey, "Brain-Inspired Hyperdimensional Computing: Robust, Scalable and Energy Efficient Classifier," Techcon'17.
74. Y. Kim, M. Imani and T. Rosing, "General-Purpose Online Classification Accelerator via In-Memory Computing," Techon'17.
75. M. Imani, T. Rosing, "CAP: Configurable Resistive Associative Processor for Near-Data Computing," IEEE ISQED'17.
76. M. Imani, D. Peroni, A. Rahimi, T. Rosing, "Non-volatile Content Addressable Memory for Computing Acceleration" NVMW'17.
77. M. Imani, Y. Kim, T. Rosing, "In-Memory Processing to Support Search-Based and Bitwise Computation" NVMW'17.
78. Pietro Mercati, Francesco Paterna, Andrea Bartolini, Mohsen Imani, Luca Benini, Tajana S. Rosing, "VarDroid: Online Variability Emulation in Android/Linux Platforms", GLSVLSI, 2016
79. Akanksha Maurya, Alper Sinan Akyurek, Baris Aksanli and Tajana Rosing, "Time-Series Clustering for Data Analysis in Smart Grid", SmartGridComm, 2016.
80. J. Venkatesh, C. Chan, A. S. Akyurek, B. Aksanli, T. S. Rosing, "A Modular Approach to Context-Aware IoT Applications," IOTDI'16.
81. A. S. Akyurek, T. S. Rosing, "Optimal In-Network Packet Aggregation Policy for Maximum Information Freshness," EUCNC'16.
82. Jinsook Yang, S. Tilak, T. S. Rosing, "Interactive Context-aware Power Management Technique for Optimizing Sensor Network Lifetime," SENSORNETS'16, nominated for the **Best paper award**.
83. Yeseong Kim, Pietro Mercati, and Tajana S. Rosing, "Power Efficient, Hierarchical, Introspection Framework for HPC Systems," TECHCON SRC Conference (TECHCON 2016), September 2016
84. M. Imani, D. Peroni, A. Rahimi, T. Rosing, "Resistive CAM Acceleration for Tunable Approximate Computing" ICCD'16. Selected as top ranked conference paper for publishing in IEEE TETC.
85. M. Imani, Y. Kim, A. Rahimi, T. Rosing, "ACAM: Approximate Computing Based on Adaptive Associative Memory with Online Learning" ISLPED'16.
86. M. Imani, A. Rahimi, Y. Kim, T. Rosing, "A Low-Power Hybrid Magnetic Cache Architecture Exploiting Narrow-Width Values" NVMSA'16.
87. M. Imani, A. Rahimi, T. Rosing, "Resistive Configurable Associative Memory for Approximate Computing" DATE'16.
88. M. Imani, S. Patil, T. Rosing, "MASC: Ultra-Low Energy Multiple-Access Single-Charge TCAM for Approximate Computing" DATE'16.
89. M. Imani, Y. Cheng, T. Rosing, "Processing Acceleration with Resistive Memory-based Computation" MEMSYS'16.
90. M. Imani, P. Mercati, T. Rosing, "ReMAM: Low Energy Resistive Multi-Stage Associative Memory for Energy Efficient Computing" ISQED'16.
91. M. Imani, S. Patil, T. Rosing, "Low Power Data-Aware STT-RAM based Hybrid Cache Architecture" ISQED'16.
92. M. Imani, Y. Kim, A. Rahimi, T. Rosing, "Associative Memory with Online Learning for Approximate Computing" Poster in DAC'16.
93. M. Imani, Y. Cheng, T. Rosing, "Resistive Memory for Approximate Program Acceleration" NVMW'16.
94. P. Mercati, A. Bartolini, F. Paterna, M. Imani, L. Benini and T. Rosing, "VarDroid: Online Variability Emulation in Android/Linux Platforms" GLSVLSI'16.
95. M. Imani, S. Patil, T. Rosing, "DCC: Double Capacity Cache for Narrow-Width Data Values" GLSVLSI'16.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

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96. M. Imani, A. Rahimi, T. Rosing, "Ultra-Efficient Content Addressable Memory for Tunable GPU Approximation" TECHCON'16.
97. M. Imani, S. Patil, T. Rosing, "Hierarchical Design of Robust and Low Data Dependent FinFET Based SRAM Array", NANOARCH'15.
98. M. Imani, S. Patil, M. Jafari, T. Rosing, "Ultra-Low Read leakage SRAM Cell Utilizing Independently-Controlled-Gate FinFET", Poster in DAC'15.
99. M. Imani, S. Patil, T. Rosing, "Using STT-RAM Based Buffers in Digital Circuits", NVMW'15.
100. B. Aksanli, A. S. Akyurek, T. S. Rosing, "User Behavior Modeling for Estimating Residential Energy Consumption," Invited paper at SGSC'15.
101. J. Venkatesh, S. Chen, P. Tinnakornsrisuphap, T. S. Rosing, "Lifetime-dependent Battery Usage Optimization for Grid-Connected Residential Systems", MSCPES, 2015.
102. Mercati P., Hanumaiah V., Kulkarni J., Bloch S. and Rosing T. "BLAST: Battery Lifetime-constrained Adaptation with Selected Target" MOBIQUITOUS 2015.
103. A. S. Akyurek and B. Aksanli and T. S. Rosing, S2Sim: Smart Grid Swarm Simulator. IGSC 2015.
104. Baris Aksanli, Alper Sinan Akyurek, Tajana Simunic Rosing, "Minimizing the Effects of Data Centers on Microgrid Instability", IGSC'15
105. Y. Kim, M. Imani, S. Patil, T. S. Rosing, "CAUSE: Critical Application Usage-Aware Memory System using Non-volatile Memory for Mobile Devices," ICCAD'15.
106. Y. Kim, F. Paterna, T. S. Rosing, "Smartphone Analysis and Optimization based on User Activity Recognition," ICCAD'15.
107. Shruti Patil, Yescong Kim, Kunal Korgaonkar, Ibrahim Ayyal, Tajana S. Rosing, "Characterization of User's Behavior Variations for Design of Replayable Mobile Workloads", MOBICASE 2015
108. F. Paterna, T. S. Rosing, "Modeling and Mitigation of Extra-SoC Thermal Coupling Effects and Heat Transfer Variations in Mobile Devices," ICCAD'15.
109. H. Rodrigues, R. Strong, T. S. Rosing, "Accurate Emulation of Fast Optical Circuit Switches", ICC'15.
110. H. Rodrigues, R. Strong, A. Akyurek, T. S. Rosing, "Dynamic Optical Switching for Latency Sensitive Applications", ACM/IEEE Symposium on Architectures for Networking and Communications Systems, 2015
111. Y. Chen, S. Patil, T. S. Rosing, "GazeTube: Gaze-Based Adaptive Video Playback for Bandwidth and Power Optimizations," Globecom 2015.
112. Jinsook Yang, S. Tilak, T. S. Rosing, "Transmission manager in heterogeneous applications running WSNs," IEEE Globecom 2015
113. Jagannathan Venkatesh, Christine Chan, Alper Sinan Akyurek, Tajana Simunic Rosing, "A Context-Driven IoT Middleware Architecture", TechCon, 2015.
114. Christine Chan, Alper Sinan Akyurek, Kalyan Vaidyanathan, Kenny Gross, Tajana Rosing, "Optimization of Energy, Cooling and IO Performance for Data-intensive Applications on Enterprise Servers", TECHCON, 2015.
115. Pietro Mercati, Francesco Paterna, Andrea Bartolini, Luca Benini, Tajana Simunic Rosing, "Variability Emulation on Real Linux/Android Devices", TECHCON 2015.
116. Jinsook Yang, S. Tilak, T. S. Rosing, "Leveraging application context for efficient sensing," IEEE ISSNIP 2014
117. Baris Aksanli and Tajana Rosing, Providing Regulation Services and Managing Data Center Peak Power Budgets. Design, Automation and Test in Europe (DATE), 2014.
118. H. Rodrigues, I. Monga, A. Sadasivarao, S. Syed, C. Guok, E. Poyoul, C. Liou, and T. S. Rosing, "Traffic Optimization in Multi-Layered WANs using SDN." IEEE High-Performance Interconnects, 2014. **Best paper award.**
119. A. Sadasivarao, H. Rodrigues, S. Syed, C. Liou, S. Balakrishnan, A. Lake, E. Poyoul, C. Guok, I. Monga, T. Rosing, "Enabling Multi-Layer Provisioning and Optimization for Core Transport Networks with Unified Packet-Optical Control Plan", 11th USENIX Symposium on Networked Systems Design and Implementation, NSDI'14.
120. H. Rodrigues, A. Akyurek, T. Rosing, "OCSEMU: SDN Enabled Fast Hybrid Optical Circuit Switch Emulator Platform to Study Application Performance in the Emerging Optical Data Center", OIDA Software Defined Photonic and Data Center Networks Workshop, 2014.
121. H. Rodrigues, R. Strong, T. Rosing, "Scheduling Optical Tunnels to Distributed Applications", USENIX Annual Technical Conference, ATC'14.
122. B. O. Akyurek and A. S. Akyurek and J. Kleissl and T. S. Rosing, TESLA: Taylor Expanded Solar Analog Forecasting. IEEE SmartGridComm 2014

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

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124. Mercati P, Bartolini A, Paterna F., Benini L and Rosing T "An On-line Reliability Emulation Framework" in Embedded and Ubiquitous Computing, IEEE Proceedings of the International Conference on (EUC14), 2014.
125. Paterna F., Zanotelli J. and Rosing T. "Ambient variation-tolerant and inter components aware thermal management for mobile system on chips" DATE'14.
126. Mercati P, Bartolini A, Paterna F., Benini L and Rosing T "A Linux-Governor Based Dynamic Reliability Manager for Android Mobile Devices" DATE'14.
127. P. Mercati, T. Simunic Rosing, V. Hanumaiah, J. Kulkarni, S. Bloch, "User-centric Joint Power and Thermal Management for Smartphones," MOBICASE'14.
128. Baris Aksanli, Alper Sinan Akyurek, Madhur Behl, Meghan Clark, Alexandre Donze, Prabal Dutta, Patrick Lazik, Mehdi Maasoumy, Rahul Mangharam, Truong X. Nghiem, Vasu Raman, Anthony Rowe, Alberto Sangiovanni-Vincentelli, Sanjit A. Seshia, Tajana Simunic Rosing, and Jagannathan Venkatesh. Distributed Control of a Swarm of Buildings Connected to a Smart Grid. 1st ACM International Conference on Embedded Systems For Energy-Efficient Buildings (BuildSys), 2014.
129. Baris Aksanli, Tajana Rosing, "Energy Management and Cost Analysis in Residential Houses using Batteries", SRC TECHCON, 2014
130. F. Seracini, X. Zhang, T. S. Rosing, I. Krueger, "A Proactive Customer-Aware Resource Allocation Approach for Data Centers", ISPA'14.
131. Yesseong Kim, Francesco Paterna, Tajana S. Rosing, Sameer Tilak, "Fine-grained Analysis and Optimization of Smartphone Applications via Automated Phase Recognition for Improved User Experience," DCOSS'14
132. B. Milosevic, J. Yang, N. Verma, S. S. Tilak, Piero Zappi, Elisabetta Farella, L. Benini, T. Simunic Rosing, "Efficient Energy Management and Data Recovery in Sensor Networks using Latent Variables Based Tensor Factorization", MSWiM, 2013.
133. A. S. Akyurek, B. Torre, T. S. Rosing, "ECO-DAC Energy Control Over Divide and Control," IEEE SmartGridComm 2013.
134. B. Aksanli, T.S. Rosing, "Optimal Battery Configuration in a Residential Home with Time-of-Use Pricing," IEEE SmartGridComm 2013.
135. C. Chan, B. Pan, K. Gross, K. Vaidyanathan, T. Rosing, "Correcting vibration-induced performance degradation in enterprise servers", SIGMETRICS Performance Evaluation Review, 2013. **Best paper award**
136. Baris Aksanli, Eddie Pettis, Tajana Rosing, "Architecting Efficient Peak Power Shaving Using Batteries in Data Centers", International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS), 2013.
137. G. Porter, R. Strong, N. Farrington, A. Forencich, P. Sun, T. Rosing, Y. Fainman, G. Papen, A. Vahdat, "Integrating Microsecond Circuit Switching into the Data Center," SIGCOMM'13.
138. Rajib Nath, Raid Ayoub, Tajana S. Rosing, "Temperature Aware Thread Block Scheduling in GPGPUs", Design Automation Conference, 2013
139. P. Mercati, A. Bartolini, F. Paterna, T. Simunic Rosing, L. Benini, "Workload and User Experience-Aware Dynamic Reliability Management in Multicore Processors," DAC 2013.
140. J. Yang, S. Tilak, D. Krishnawamy, T Simunic Rosing, "A novel protocol for adaptive broadcasting of sensor data in urban scenarios," GLOBECOM, 2013.
141. Baris Aksanli, Eddie Pettis, Tajana Rosing, "Distributed Battery Control for Peak Power Shaving in Data Centers ", International Green Computing Conference (IGCC), 2013.
142. J. Venkatesh, B. Aksanli, Jean-Claude Junqua, Philippe Morin, T. Simunic Rosing, "HomeSim: Comprehensive, Smart, Residential Electrical Energy Simulation and Scheduling", IGCC'13.
143. Baris Aksanli, Jagannathan Venkatesh, Tajana Rosing, and Inder Monga, "A Comprehensive Approach to Reduce the Energy Cost of Network of Datacenters", ISCC, 2013. **Best paper award**
144. Jagannathan Venkatesh, Baris Aksanli, and Tajana Rosing, "Residential Energy Simulation and Scheduling: A Case Study Approach", International Symposium on Computers and Communications (ISCC), 2013
145. Rajib Nath, Douglas Carmean and Tajana S. Rosing, "Power Modeling and Thermal Management Techniques for Many Core Processors", The IEEE symposium on Computers and Communications (ISCC), 2013.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

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146. L. Zhang, G. Dhiman, and T. S. Rosing, "vGreenNet: Managing Server and Networking Resources of Co-located Heterogeneous VMs", IEEE International Parallel and Distributed Processing Symposium (IPDPS), High Performance Grid and Cloud Computing, 2013.
147. Filippo Seracini, Xiang Zhang, Ingolf Krueger, Tajana Rosing, Massimiliano Menarini, "Green Web Services: Improving Energy Efficiency in Data Centers via Workload Predictions," ICSEWS'13 GREENS.
148. Andrew B. Kahng, Siddhartha Nath, Tajana S. Rosing, "On Potential Design Impacts of Electromigration Awareness," ASPDAC'13.
149. Nima Nikzad, Nakul Verma, Celal Zifci, Elizabeth Bales, Nichole Quick, Piero Zappi, Kevin Patrick, Sanjoy Dasgupta, Ingolf Krueger, Tajana Simunic Rosing, William G. Griswold, "CitiSense: Improving Geospatial Environmental Assessment of Air Quality Using a Wireless Personal Exposure Monitoring System", Wireless Health 2012. **Best paper award.**
150. G. Dhiman, V. Kontorinis, R. Ayoub, L. Zhang, C. Sadler+, D. Tullsen, T. Simunic Rosing, "Themis: Energy Efficient Management of Workloads in Virtualized Data Centers," EuroPar-VHPC'12.
151. Mohammad Moghimi, Jagannathan Venkatesh, Piero Zappi and Tajana Rosing, "Context-Aware Mobile Power Management Using Fuzzy Inference as a Service," MobiCASE'12.
152. V. Kontorinis, E. Zhang, B. Aksanli, J. Samson, H. Homayoun, E. Pettis, D. Tullsen, T. Simunic Rosing, "Managing Distributed UPS Energy for Effective Power Capping in Data Centers," ISCA 2012.
153. R. Strong, S. Kang, K. Jeong, A. Kahng, T. Simunic Rosing, "TAP: Token-aware Power Gating," ISLPED'12.
(Note: authors listed in the order of contribution: the paper had alphabetical order)
154. C. Chan, Y. Jin, YK Wu, K. Gross, K. Vaidyanathan, R. Ayoub, T. Simunic Rosing, "Fan-Speed-Aware Scheduling of Data Intensive Jobs," ISLPED'12.
155. P. Zappi, E. Bales, JH Park, W. Griswold and T. Šimunić Rosing, "The CitiSense Air Quality Monitoring Mobile Sensor Node," IPSN-Mobile Sensing, 2012.
156. R. Herrmann, P. Zappi, T. Simunic Rosing, "Context Aware Power Management of Mobile Systems for Sensing Applications," IPSN-Mobile Sensing, 2012.
157. R. Ayoub, R. Nath, T. Simunic Rosing, "JETC: Joint Energy Thermal and Cooling Management for Memory and CPU Subsystems in Servers," HPCA 2012.
158. Nima Nikzad, Jinseok Yang, Piero Zappi, Tajana Simunic Rosing, and Dilip Krishnaswamy, "Model-driven Adaptive Wireless Sensing for Environmental Healthcare Feedback Systems," IEEE ICC 2012.
159. Baris Aksanli, Tajana S. Rosing, Inder Monga, "Benefits of Green Energy and Proportionality in High Speed Wide Area Networks Connecting Data Centers," DATE 2012.
160. R. Strong, S. Kang, K. Jeong, A. Kahng, T. Simunic Rosing, "MAPG: Memory Access Power Gating," DATE'12.
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161. S. Sharifi, R. Ayoub, T. Simunic Rosing, "TempoMP: Integrated Prediction and Management of Temperature in Heterogeneous MPSoCs," DATE'12.
162. Baris Aksanli, Jagannathan Venkatesh, Liuyi Zhang, Tajana Rosing, "Utilizing Green Energy Prediction to Schedule Mixed Batch And Service Jobs in Data Centers," HotPower 2011.
163. R. Ayoub, U. Ogras, E. Gorbato, Y. Jin, T. Kam, P. Diefenbaough, T. Rosing, "OS-level Power Minimization Under Tight Performance Constraints in General Purpose Systems," ISLPED 2011.
164. Denis Dondi, Piero Zappi, Tajana Šimunić Rosing, "A Scheduling Algorithm for Consistent Monitoring Results with Solar Powered High-Performance Wireless Embedded Systems," ISLPED 2011.
165. Y. Wu, S. Sharifi, T. Simunic Rosing, "Distributed Thermal Management for Embedded Heterogeneous MPSoCs with Dedicated Hardware Accelerators", ICCD 2011.
166. S. Sharifi, Yen-Kuan Wu, T. Simunic Rosing, "Temperature-aware Scheduling for Embedded Heterogeneous MPSoCs with Special Purpose IP Cores," ETMEC 2011.
167. R. Ayoub, K. Indukuri, T. Simunic Rosing, "Energy Efficient Proactive Thermal Management in Memory Subsystem," ISLPED 2010.
168. G. Dhiman, K. Mihic, T. Simunic Rosing, "A system for online power prediction in virtualized environments using Gaussian mixture models," DAC'10.
169. Nichole Quick, Kevin Patrick, Nima Nikzad, Celal Zifci, Piero Zappi, Priti Aghera, Nakul Verma, Barry Demchak, PJE Quintana, Ingolf Krueger, Tajana Rosing, Sanjoy Dasgupta, Hovav Shacham & William Griswold, "CitiSense – Adaptive Services for Community-Driven Behavioral and Environmental Monitoring to Induce Change," invited poster at mHealthSummit 2010

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

170. Claudiu Farcas, Filippo Seracini, Ingolf Krüger and Tajana Simunic Rosing, "Greening Datacenters through Software," invited poster at NASA Workshop on Global Collaboration in Environmental and Alternative Energy Strategies, 2010.
171. G. Dhiman, V. Kontorinis, D. Tullsen, T. Rosing, E. Saxe, J. Chew, "Dynamic Workload Characterization for Power Efficient Scheduling on CMP Systems," ISLPED 2010.
172. D. Dondi, A. Di Pompeo, C. Tenti, and T. S. Rosing, "SHiMmer: A Wireless Harvesting Embedded System for Active Ultrasonic Structural Health Monitoring," IEEE Sensors 2010.
173. P. Aghera, D. Krishnaswamy, T. Rosing, "DynAGreen: Hierarchical Dynamic Energy Efficient Task Assignment for Wireless Healthcare Systems," BodyNets, 2010.
174. E.B. Flynn, S. Kpotufe, D. Harvey, E. Figueiredo, S. Taylor, D. Dondi, T. Mollov, M.D. Todd, T.S. Rosing, G. Park, and C. Farrar, "SHMTools: a new embeddable software package for SHM applications," *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems*, SPIE, 2010.
175. C. Olschanowsky, L. Carrington, M. Tikir, M. Laurenzano, T. Rosing, A. Snavely, "Fine-grained Energy Consumption Characterization and Modeling," DOD High Performance Computing Modernization Program User Group Conference, June 2010.
176. R. Ayub, S. Sharifi, T. Simunic Rosing, "GentleCool: cooling aware proactive workload scheduling in multi-machine systems," DATE'10.
177. P. Aghera, A. Coskun, D. Fang, D. Krishnaswamy, T. Simunic Rosing, "DynAHeal: Dynamic energy efficient task assignment for wireless healthcare systems," DATE'10.
178. A. Sitaraman, D. Dondi, T. Simunic Rosing, "DVFS Based Task Scheduling in a Harvesting WSN for Structural Health Monitoring," DATE'10.
179. A. Coskun, D. Atienza, T. Simunic Rosing, "Energy-efficient variable-flow liquid cooling in 3D stacked architectures," DATE'10.
180. R. Ayoub, T. Simunic Rosing, "Cool and Save: Cooling Aware Dynamic Workload Scheduling in Multi-socket CPU Systems," ASPDAC'10.
181. S. Sharifi, A. Coskun, T. Simunic Rosing, "Hybrid Dynamic Energy and Thermal Management in Heterogeneous Embedded Multiprocessors," ASPDAC'10.
182. E. Regini, T. Simunic Rosing, "An Energy Efficient Wireless Communication Mechanism for Sensor Node Cluster Heads," ISSNIP'09.
183. A. Coskun, J. Ayala, D. Atienza, T. Simunic Rosing, "Modeling and Dynamic Management of 3D Multicore Systems with Liquid Cooling," *Best paper award* at VLSI-SOC 2009.
184. A. Coskun, A. Kahng, T. Simunic Rosing, "Temperature- and Cost-Aware Design of 3D Multiprocessor Architectures", DSD'09.
185. A. Coskun, R. Strong, D. Tullsen, T. Simunic Rosing, "Evaluating the Impact of Job Scheduling and Power Management on Processor Lifetime for Chip Multiprocessors," SIGMETRICS'09.
186. R. Ayoub, T. Simunic Rosing, "Predict and Act: Dynamic Thermal Management for Multicore Processors," ISLPED'09.
187. G. Dhiman, R. Ayoub, G. Marchetti, T. Simunic Rosing, "vGreen: A System for Energy Efficient Computing in Virtualized Environments," *Nominated for the best paper award* at ISLPED'09.
188. G. Dhiman, R. Ayoub, T. Simunic Rosing, "PDRM: A hybrid PRAM DRAM main memory system", DAC'09.
189. P. Aghera, D. Fang, T. Simunic Rosing, K. Patrick "Energy management in wireless healthcare systems," IPSN'09.
190. J. Bradely Steck, T. Simunic Rosing, "Adapting Performance in Energy Harvesting Wireless Sensor Networks for Structural Health Monitoring Applications," *Invited paper* at IWSHM'09.
191. J. Bradely Steck, T. Simunic Rosing, "Adapting Task Utility in Externally Triggered Energy Harvesting Wireless Sensing Systems," INSS'09.
192. J. Recas, C. Bergonzini, T. Simunic Rosing, D. Atienza, "Prediction and Management in Energy Harvested Wireless Sensor Nodes," *Invited paper* at Wireless VITAE'09.
193. J. Recas, C. Bergonzini, B. Lee, T. Simunic Rosing, "Solar energy harvesting prediction algorithm," Energy Harvesting Workshop'09.
194. A. K. Coskun, T. Simunic Rosing, J. Ayala, D. Atienza, Y. Leblebici, "Dynamic Thermal Management in 3D Multicore Architectures," DATE 2009.
195. A. Coskun, T. Simunic Rosing, K. Gross, "Proactive temperature balancing for low cost thermal management in MPSoCs," ICCAD'08.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

196. G. Dhiman, K. Pusukuri, T. Simunic Rosing, "Analysis of Dynamic Voltage Scaling for System Level Energy Management," *USENIX-HotPower'08*.
197. E. Regini, D. Lim, T. Simunic Rosing, "Distributed scheduling for heterogeneous wireless sensor networks," *IASTEAD'08*.
198. A. Coskun, T. Simunic Rosing, K. Gross, "Proactive temperature management in MPSOCs," *ISLPED'08*.
199. A. Coskun, T. Simunic Rosing, K. Gross, "Temperature management in MPSOCs using online learning," *DAC'08*.
200. A. Coskun, T. Simunic Rosing, "Temperature-aware MPSOC scheduling for reducing hot spots and gradients," *ASPDAC'08*.
201. S. Sharifi, T. Simunic Rosing, "An analytical model for the upper bound on temperature differences on a chip," *GLVLSI'08*.
202. S. Sharifi, T. Simunic Rosing, "Accurate temperature sensing for efficient thermal management," *ISQED'08*.
203. G. Dhiman, T. Simunic Rosing, "Dynamic Voltage Scaling using Machine Learning," *ISLPED'07*.
204. O. Milenkovic, R. Baraniuk, and T. Simunic Rosing, "Compressed sensing meets bioinformatics: A novel DNA microarray design," in *Second Annual ITA Workshop*, San Diego, California, January 2007.
205. Todd, M., Mascarenas, D., Flynn, E., Rosing, T., Lee, B., Musiani, D., Dasgupta, S., Kpotufe, S., Hsu, D., Gupta, R., Park, G., Overly, T., Nothnagel, M., Farrar, C., "A different approach to sensor networking for SHM: Remote powering and interrogation with unmanned aerial vehicles", *Keynote at Workshop on Structural Health Monitoring*, 2007.
206. D. Musiani, K. Lin, T. Simunic Rosing, "An Active Sensing Platform for Structural Health Monitoring Application," *IPSN-SPOTS'07*.
207. A. Coskun, T. Simunic Rosing, "Temperature-aware task scheduling," *DATE'07*.
208. D. Lim, J. Shim, T. Simunic Rosing, T. Javidi, "Scheduling data delivery in heterogeneous wireless sensor networks," *ISM'06*.
209. G. Dhiman, T. Simunic Rosing, "Dynamic Power Management Using Machine Learning," *Nominated for the best paper award at ICCAD'06*.
210. A. Coskun, T. Simunic Rosing, "A Simulation Methodology for Reliability Analysis in Multi-Core SoCs," *GVLSI'06*.
211. T. Simunic, K. Mihic, G. De Micheli, "Optimization of Reliability and Power Consumption in Systems on a Chip," *PATMOS'05*.
212. T. Simunic, W. Quadeer, G. De Micheli, "Managing heterogeneous wireless environments via Hotspot servers," *MMCN'05*.
213. T. Simunic, K. Mihic, G. De Micheli, "Reliability and Power Management of Integrated Systems," *Invited paper at DSD'04*.
214. G. Manjunath, V. Krishnan, T. Simunic, J. Tourrilhes, A. McReynolds, D. Das, V. Srinivasamurthy, A. Srinivasan, "Smart Edge Server – going beyond a wireless access point," *WMASH'04*.
215. O. Celebican, T. S. Rosing, V. J. Mooney, "Energy estimation of peripheral devices in embedded systems," *GLVLSI'04*.
216. W. Quadeer, T. Simunic, J. Ankcorn, V. Krishnan, G. De Micheli, "Heterogeneous wireless network management", *PACS'03*.
217. A. Acquaviva, T. Simunic, V. Deolalikar, S. Roy, "Remote Power Control of Wireless Network Interfaces", *PATMOS'03*.
218. B. Delaney, N. Jayant, T. Simunic, "A WLAN Scheduling Algorithm to Reduce the Energy Consumption of a Distributed Speech Recognition Front-End", *ESTIMedia'03*.
219. A. Peymandoust, T. Simunic, G. De Micheli, "Complex Software Library Element Mapping with Symbolic Algebra", *DAC'02*.
220. T. Simunic, S. Boyd, "Managing Power Consumption in Networks on Chips", *DATE'02*.
221. A. Peymandoust, T. Simunic, G. De Micheli, "Low Power Embedded Software Optimization using Symbolic Algebra", pp. 1052-1057, *DATE'02*.
222. B. Delaney, N. Jayant, M. Hans, T. Simunic, A. Acquaviva, "Low-Power Fixed-Point Front-End Feature Extraction for Distributed Speech Recognition", *ICASSP'02*.
223. T. Simunic, L. Benini, A. Acquaviva, P. Glynn, G. De Micheli, "Dynamic Voltage Scaling for Portable Systems", *DAC'01*.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

224. T. Simunic, L. Benini, P. Glynn, G. De Micheli: "Dynamic Power Management of Portable Systems", MOBICOM'00.
225. T. Simunic, L. Benini, G. De Micheli, M. Hans: "Source Code Optimization and Profiling of Energy Consumption in Embedded Systems", *Invited paper* at ISSS'00.
226. T. Simunic, H. Vikalo, P. Glynn, G. De Micheli: "Energy Efficient Design of Portable Wireless Systems", ISLPED'00.
227. T. Simunic, L. Benini, P. Glynn, G. De Micheli: "Dynamic Power Management of Laptop Hard Disk", DATE'00.
228. Y. Lu, E. Chung, T. Simunic, L. Benini, G. De Micheli: "Quantitative Comparison of Power Management Algorithms", pp.20-26, DATE'00. Selected for publication in *The Most Influential Papers of 10 Years DATE*, Edited by Lauwereins, Rudy; Madsen, Jan, 2008.
229. T. Simunic, L. Benini, G. De Micheli: "Event-driven Power Management of Portable Systems", ISSS'99.
230. T. Simunic, L. Benini, G. De Micheli: "Energy-efficient design of Battery-Powered Embedded Systems", ISLPED'99.
231. T. Simunic, L. Benini, G. De Micheli: "Cycle-Accurate Simulation of Energy Consumption in Embedded Systems", DAC'99.
232. Y. Lu, T. Simunic, G. De Micheli: "Software Controlled Power Management", CODES'99.
233. J. Rozenblit, T. Simunic: "Techniques for Intelligent VLSI Interconnect Design," DMC'94.
234. T. Simunic, J. Rozenblit: "Reduction of Signal Delay and Crosstalk in Electronic Packaging," EPEP'93.
235. T. Simunic, P. Hsu, J. Rozenblit, C. Wolff, J. Prince, A. Cangellaris: "An Integrated Framework for Modeling and Simulation of Electronic Packaging," TECHCON'93.

BOOK CHAPTERS

1. S. Patil, Y. Kim, K. Korgaonkar, I. Awwal, T. S. Rosing, "Characterization of User's Behavior Variations for Design of Replayable Mobile Workloads," in Mobile Computing, Applications, and Services, Volume 162 of the series Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, pp 51-71, January, 2016.
2. Baris Aksanli, Jagannathan Venkatesh, Inder Monga, and Tajana Rosing, "Renewable Energy Prediction for Improved Utilization and Efficiency in Datacenters and Backbone Networks," Computational Sustainability Springer Book Chapter, 2015.
3. Ayse K. Coskun, J. Ayala, D. Atienza, T. Simunic Rosing: "Thermal Modeling and Management of Liquid-Cooled 3D Stacked Architectures," Editors: J. Becker, M. Johann and R. Reis, Springer, VLSI-SoC: Technologies for Systems Integration (ISBN: 978-3-642-23119-3), p. 34-55, 2011.
4. G. Dhiman, R. Ayoub, T. Simunic Rosing, "Energy and Thermally Aware Scheduling in Datacenters," in Energy-Efficient Distributed Computing, Edited by Albert Zomaya & Young Choon Lee, Wiley-Interscience 2010.
5. N. Nikzad, P. Aghera, P. Zappi, T. Simunic Rosing, "Energy Management in Heterogeneous Wireless Healthcare Networks," in Energy-Efficient Distributed Computing, Edited by Albert Zomaya & Young Choon Lee, Wiley-Interscience 2010.
6. Ayse K. Coskun, J. Ayala, D. Atienza, T. Simunic Rosing, Thermal Modeling and Management of Liquid-Cooled 3D Stacked Architectures, Editors: J. Becker, M. Johann and R. Reis, Springer, VLSI-SoC: Technologies for Systems Integration (ISBN: 978-3-642-23119-3), p. 34-55, 2011.
7. Y. Lu, E. Chung, T. Simunic, L. Benini, G. De Micheli: "Quantitative Comparison of Power Management Algorithms", in *The Most Influential Papers of 10 Years DATE*, Edited by Lauwereins, Rudy; Madsen, Jan, Springer-Verlag, 2008.
8. J. Kim, T. Simunic Rosing, "Power-aware resource management techniques for low-power embedded systems," in Handbook of Real-Time and Embedded Systems, Edited by S. H. Son, I. Lee, J. Y-T Leung, Taylor-Francis Group LLC, 2006.
9. T. Simunic: "Dynamic Management of Power Consumption" in Power Aware Computing, Edited by R. Graybill, R. Mehlem, Kluwer Academic Publishers pp.102-125, 2002.

PATENTS

1. T. Simunic Rosing, "Device and method for identifying a communication interface that performs an operating parameter closer to a desired performance level than another communication interface performs the operating parameter," US7246181B2, Priority date 2004-09-14.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

2. V. Deolalikar, T. Simunic, "Method and system for power control in wireless portable devices using wireless channel characteristics", US20050170801A1, Priority date 2004-01-30.
3. T. Simunic, O. Celebicani, "Arrangement and method of estimating and optimizing energy consumption of a system including I/O devices," US20050171753A1, Priority date 2004-01-30.
4. T. Simunic, A. Acquaviva, L. Benini, "Application-driven method and apparatus for limiting power consumption in a processor-controlled hardware platform," US7272730B1, Priority date 2003-07-31.
5. T. Simunic, N. Mehta, C. Crome, "Method and Device for Test Vector Analysis", US6197605B1, Priority date 1996-04-10.

THESES (supervised & published)

1. J. Sim, "Architecting Non-volatile Memory for High Bandwidth Systems," 2019.
2. D. Peroni, "Approximate Computing for GPGPU Acceleration," PhD, 2019.
3. C. Chan, "Context-aware Platform Design and Optimization," PhD, 2017.
4. A. S. Akyurek, "Optimized Energy Control in Power Distribution Systems," PhD, 2017.
5. P. Mercati, "Power, Thermal, Reliability and Variability Management of Mobile Devices," PhD, 2016.
6. J. Venkatesh, "A Context-aware Approach for Automation of End-User Elements in the Smart Grid," PhD, 2016.
7. J. Yang, "Energy Efficient Data Aggregation in Sensor Networks," PhD, 2015.
8. B. Aksanli, "Energy and Cost Efficient Datacenters," PhD, 2015.
9. R. Strong, "Low-Latency Techniques for Improving System Energy Efficiency," PhD, 2013.
10. V. Kontorinis, "Adaptive Architectures for Peak Power Management," PhD, 2013.
11. S. Sharifi, "Accurate Temperature Sensing and Efficient Dynamic Thermal Management in MPSoCs," PhD, 2011.
12. R. Ayoub, "Temperature and Cooling Management in Computing Systems," PhD, 2011.
13. G. Dhiman, "Dynamic Workload Characterization for Energy Efficient Computing," PhD, 2011.
14. R. Herrmann, "Context based energy management for sensing applications," MS, 2011.
15. A. K. Coskun, "Efficient Thermal Management for Multiprocessor Systems," PhD 2009.
16. E. Regini, "Resource management in heterogeneous wireless sensor networks," MS 2009.
17. J. Stock, "Energy and task management in energy harvesting wireless sensor networks for structural health monitoring," MS 2009.
18. C. Bergonzini, "Management of solar harvested energy in actuation based embedded systems," MS 2009.
19. D. Lim, "Distributed proxy-layer scheduling in heterogeneous wireless networks," MS 2007.
20. D. Musiani, "Design of an active sensing platform for wireless structural health monitoring," MS 2007.
21. T. Simunic, "Energy efficient system design and utilization," PhD 2001.
22. T. Simunic, "VLSI interconnect design automation using qualitative and quantitative techniques," MS 1993.

ACADEMIC COMMUNITY SERVICE

- IEEE CEDA Kuh Early Career Award Committee 2018, 2019
- Distinguished speaker UC Riverside, 2019.
- Distinguished speaker UC Irvine 2019
- TPC track chair, DATE, 2019-2020
- DAC women in EDA invited panel speaker, 2019
- JUMP CBRIC invited speaker, 2019
- JUMP ADA invited speaker, 2019
- DARPA ERI invited speaker, 2019
- ICCAD TPC member, 2019
- DATE women in EDA invited panel speaker 2018
- Keynote speaker at IEEE/ACM Workshop on Variability Modeling and Characterization, 2018
- Keynote speaker at IEEE Reliability Symposium 2018
- GLOBECOMM 2015 Executive committee member, Tutorials Chair
- Invited speaker at WIC Panel, 2015.
- ISCC 2013 chair of the TPC executive committee
- DATE 2011-2012, 2012-2013 TPC Track Chair
- ISLPED 2012 TPC Track Chair

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

- DAC 2013 WIP Chair, ESS Chair
- Associate Editor for IEEE Transactions on Mobile Computing 2008-2012
- Associate Editor for IEEE Transactions on Circuits and Systems 2003-2005
- Invited speaker at WEED-ESSA panel on "Cross-stack Energy-optimization - Fact or Fiction?" on June 9th at ISCA, Portland.
- CRA-W workshop presentations
- Session chair for DATE, ISLPED, DAC, ICCAD
- Technical paper committee for many conferences, such as DAC, DATE, ASPLOS, IPSN, ICCAD, ISLPED, ISCA, MMCN, HotPower, SECON.
- Reviewer for a number of publications ranging from Proceedings of the IEEE, to IEEE Transactions on Computers, IEEE Transactions on VLSI, IEEE Transactions on CAD, IEEE Transactions on Mobile Computing, IEEE Computer, IEEE Transactions on Computers, IEEE Micro, ACM TECS, ACM TODAES, ACM TOSN, and conferences such as DATE, DAC, ISLPED, ICCAD, IPSN and many others
- Technical reviewer for Alfred Sloan Grant & Dutch Ministry of Economic Affairs, Estonian NSF

UNIVERSITY SERVICE

- Ad-hoc committee for an endowed chair appointment in CSE, 2019.
- JSOE Dean's Faculty Council, 2019-pres.
- Member of UCSD Committee on Committees 2019-pres.
- HDSI Faculty Member of Clusters on Data Science Theory, Methods and Tools; Cross-cutting areas and systems, Improving Quality of Life, and Enabling Scientific Discovery 2018-pres.
- Dean Pisano Performance Review Committee CSE Representative 2018
- Ad-hoc committee for two endowed chair appointments in SOE, 2018.
- LPSOE recruiting committee, 2017-2019
- SP-SOC committee member 2018-pres.
- Co-creator of Jean Ferrante diversity scholarship (with Arun Kumar) 2018
- School of Engineering Building Committee 2015-2018
- UCSD Undergraduate Council Member 2016-2018
- Precision Medicine SOE recruit committee, 2017-2018
- Chair of Undergraduate Council's Department of Math Review Committee, 2017.
- Chair of Undergraduate Council's Department of Religion Review Committee, 2018.
- Director for \$10M UCSD-IBM AI for Healthy Living Center, 2017-2018.
- Diversity Coordinator for CSE Department, 2016 - Present
- IDEA Center Board Member, 2017-pres.
- University Faculty Recruitments for Sensors, Devices, and Imaging Committee, 2017-18.
- Mental Health & Technology Center executive board faculty member, 2017-pres.
- Qualcomm Institute (CalIT2) ORU Review, 2017.
- Featured Speaker at the UCSD's Founder's Symposium, "An Evening of Nonconventional Wisdom: AI for Healthy Aging," 2017.
- Teaching faculty recruit committee, 2017-pres.
- Board member, IDEA Center, 2017-pres.
- Diversity coordinator for CSE Department, 2017-pres.
- Dean review committee 2018
- Triton Drone Racing club faculty advisor 2016-2018
- UCSD Undergraduate Council Member 2016-2018
- Involved in 10 UCSD Centers: Center for Contextual Robotics, Center for Wearable Sensors, Center for Energy Research, Center for Networked Systems, Center for Wireless and Population Health Systems, Sustainable Power and Energy Center, San Diego Supercomputing Center, Qualcomm Institute
- University Diversity in Precision Medicine Faculty Recruitments for Sensors, Devices, and Imaging Committee, 2015-16
- Eastern Europe Outreach 2015-2016

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

- School of Engineering Building Committee 2015-2016
- MS comprehensive exam planning committee 2015
- MS project review 2015, 2016
- CSE PhD admission committee 2014-2016
- MAS AESE Program Review 2014-2015
- Graduate students' committee 2012-2014
- Executive board member of San Diego Supercomputing Center 2008-pres.
- University energy initiatives committee, 2012-2013
- JSOE energy faculty search committee, 2012-2013
- Graduate students committee (gradcom) 2012-2013
- Member of the search committee for SDSC director 2009-pres.
- Engineering Wide Initiatives Committee, 2008-09
- Faculty Advisor, Women in Computing, 2005 - pres.
- Calit2 System-on-a-Chip Committee, Chair, 2005 - 06
- Faculty Recruiting Committee, 2005 - 06
- Computer Engineering Program Committee, 2005 - 08
- Masters Students Admissions and Affairs Committee, 2005 - 09
- Computer Engineering Space Committee, Chair, 2005 - 09

TEACHING EXPERIENCE

Fall 05 - pres.

UCSD - Full professor

- taught an undergraduate class in logic circuit design (CSE 140): 95% of students said they recommend me as an instructor, 2005-pres.
- designed, got funding and set up a brand new graduate level class and lab in embedded systems (CSE237a): 98% of students said they recommend me as instructor for the class, 2005-pres
- developed a new course on SmartGrid that attracted students, researchers and faculty across CSE, ECE, mechanical engineering, nano engineering and structural engineering departments, 2015.
- Designed and taught a new course on Internet of Things, 2016.
- Designed and taught new courses on Emerging Computing, and SW for Acceleration, 2018
- Taught a new course on Hardware acceleration for bioinformatics workloads, 2019
- Designed and taught an embedded systems class that is a part of new Master of Advanced Studies program in Wireless and Embedded Systems at UCSD

Winter 02

STANFORD UNIVERSITY - lecturer

- taught a graduate course on Logic Synthesis of VLSI Circuits: lead a team of TAs and graders

HONORS & AWARDS

- IEEE Fellow, 2018
- Awarded John J. and Susan M. Fratanico Endowed Chair in CSE Department, 2014.
- Keynote at IEEE International High-Level Design Validation and Test, "Reliability and Maintainability of IoT systems," 2017.
- UCSD Sustainability Award for the Postdoc in my group, 2016.
- FISP Award 2015.
- UCSD Research Expo Best poster awards, 2010, 2012 (two honorable mention), 2013 (two honorable mention).
- Von Liebig Entrepreneurism Center Innovation Award in Information Technology for "SOPRA - A Proactive Service Oriented Self-Adaptive Framework for Data Center Resource Optimization," 2013
- CitiSense project covered in the NY Times and the Wall Street Journal, December 2012
- TODAES journal paper is the top most downloaded paper in 2010-2011
- Publication selected for inclusion in *The Most Influential Papers of 10 Years DATE*, Edited by Lauwereins, Rudy; Madsen, Jan, 2008.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

- Nominated as one of MIT's top 100 researchers in 2002
- NSF Design and Manufacturing Grantee and SRC Research Assistantship 1993
- Lowell's Award for the Best Student in Science at the Northern Arizona University 1992
- NASA Undergraduate Research Fellowship 1991

FUNDING (as PI, Co-PI, senior contributor, student support)

- NSF CC-NPEQ, \$2.5M, 2018-2021
- NSF NRI \$2.5M, 2018-2020
- DARPA/SRC JUMP CRISP \$40M, 2018-2023
- KACST IoT, \$2.9M, 2017-2019
- GRC IoT Reliability, \$240k, 2018-2021
- IBM-UCSD AIHL, \$16.3M, 2017-2022
- NSF CPS CHASE-CI, \$1M, 2017-2020
- Samsung IoT, \$300k, 2018
- Huawei, \$100k, 2018
- Intel, \$300k, 2016-2018.
- ARPA-E NODES \$2.5M, 2016-2018.
- NSF CSR \$450k
- NSF MetaSense \$1.126M
- Qualcomm FMA, Energy management of residences in the grid, \$75k, 2014-2015.
- CEC EISG, Energy management in data centers, \$95k, 2013-2014.
- NSF CSR, Energy efficient data centers, \$300k, 2013-2016.
- FCRP center "TerraSwarm," \$27.5M, 2013-2017
- NSF SCH: EXP SenseHealth, \$618k, 2013-2016
- NSF MRI visualization \$2M, 2013-2016
- Oracle gift, \$62k, 2012
- Google gift, \$57k, 2012 CSE
- NSF MRI optical networking \$1.06M, 2012-2014
- NSF OCI Sensor-Rocks, \$274k, 2012-2014.
- NSF CCF, \$450k, 2012-2015.
- Futurewei gift, \$117k, 2012.
- Panasonic gift, \$100k, 2012.
- Qualcomm FMA, \$75k, 2012-2014.
- SRC, \$150k, 2011-2014
- Qualcomm membership, \$150k, 2011
- Oracle gift, \$100k, 2011, CNS
- Google gift, \$75k, 2011, CNS
- Google, \$125k, 2010, CSE
- Qualcomm gift, \$35k, 2010.
- Microsoft gift, \$300k, 2010
- NSF-ERC CIAN, \$14M total, 2010-2019
- NSF-Expedition on Variability, \$4.02M, 2010-2015
- NSF OCI INRC: TransLight/StarLight, \$2.05M, 2010-2014
- Qualcomm gift, \$75k, 2010-2011
- CNS, \$75k, 2010
- NSF-CPS, \$1.5M, 2009-2013
- Sun Microsystems Gift, \$120k, 2009
- Google, \$50k, 2009.
- Qualcomm Gift, \$15k, 2009
- NIH PALMS, \$3.2M, 2007-2011

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

- MARCO-MuSyC center, \$3M, 2009-2012
- NSF CCF ARRA, \$476k, 2009-2013
- NSF GreenLight, \$20M, 2008-2012
- NSF FlashGordon, \$22M, 2011-2015
- Cisco Gift, \$80k, 2008-2009
- MARCO-GSRC Grant, \$154k, 2008-2009
- CNS Grant for thermal management, \$142k, 2008-2010
- CNS Grant for healthcare, \$116k, 2008-2010
- Xilinx gift of 20 XUP DVKs
- UC Micro Grant, \$30k, 2008-2010
- Sun Microsystems Gift, \$100k, 2008-2009
- NSF-CCF \$600k, sensing, 2007-2011
- Sun Microsystems Gift, \$60k, 2007
- CNS Grant, \$130k, 2006-2008
- NSF – HPWREN, \$3M, 2005-2009.
- LANL Structural Health Monitoring, \$7M, 2005-2009.
- UC Micro, \$30k, 2006.
- Sun Microsystems Gift, \$50k, 2005.
- CNS Grant, \$60k, 2005.
- Intel Grant, \$200k, 2005.
- UC Graduate and Travel Grant \$11k, 2005
- HP Labs - \$100k, 2003-2004

INVITED TALKS

1. Sony, CA, “Accelerating machine learning & HD computing using PIM,” 2019.
2. ARM, CA, “Power, performance, thermal & reliability modeling and management in IoT systems,” 2019.
3. Intel, OR, “Power, performance, thermal & reliability modeling and management in IoT systems,” 2019.
4. EPFL, Switzerland, “Context-aware learning and acceleration,” 2019.
5. Yahoo, CA, “Context-aware learning and acceleration,” 2019.
6. Workshop on Brain-Inspired Architectures, NV, “Hyperdimensional Computing & Applications,” 2019.
7. Non-volatile Memory Workshop, “Hyperdimensional Computing and Its Applications,” 2019.
8. Altera, CA, “Accelerating Bioinformatics Workloads,” 2019.
9. IBM Research, CA, “Accelerating machine learning & HD computing using PIM,” 2019.
10. Huawei, CA, “Thermal management in mobiles,” 2018.
11. Samsung, CA, “Context-aware management in Smart Homes,” 2018.
12. IBM Research in Austin, TX, “Context-awareness for healthy aging,” 2018.
13. Xconomy, CA, “Big data meets big biology: Accelerating learning for healthy living,” 2018.
14. Huawei, China, “Proactive power and thermal management strategies,” 2018.
15. Samsung, CA, “Smart Homes: context-aware management,” 2018.
16. Intel Research, OR, “Reliability Management for IoT Systems,” 2018.
17. DARPA Electronic Resurgence Initiative, CA, “JUMP CRISP Center Overview,” 2018.
18. Micron, CA, “Accelerating machine learning workloads using PIM,” 2018.
19. JUMP C-BRIC Center, USA, “Accelerating machine learning & HD computing using PIM,” 2018.
20. JUMP ADA Center, USA, “Accelerating machine learning & HD computing using PIM,” 2018.
21. TSMC, Taiwan, “Accelerating machine learning & HD computing using PIM,” 2018.
22. GM, USA, “Context-aware management for IoT systems,” 2018.
23. China government delegation, CA, “Context-aware learning and acceleration,” 2018.
24. NSF CSR Workshop, WA, “Accelerating learning using PIM,” 2018.
25. HLTV Keynote, “Reliability and Maintainability of IoT systems,” 2017.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

26. IBM, Austin, TX, "Context-aware IoT Systems," 2017.
27. Sony, Japan, "Context-aware IoT Systems" & "UCSD-IBM AI for Healthy Living Center", 2017.
28. D-Link, Japan, "UCSD-IBM AI for Healthy Living Center", 2017.
29. A-Star, Singapore, "UCSD-IBM AI for Healthy Living Center", 2017.
30. NRF, Singapore, "UCSD-IBM AI for Healthy Living Center", 2017.
31. NUS, Singapore, "UCSD-IBM AI for Healthy Living Center", 2017.
32. IBM, Kawasaki, Japan, "Context-aware IoT Systems, their Acceleration & Management," 2017.
33. Sony, Tokyo, Japan, "Context-aware IoT Systems, their Acceleration & Management," 2017.
34. IEEE/ACM Workshop on Variability Modeling and Characterization, Irvine, CA, "Increasing computational efficiency with novel computing paradigm," <http://www.cerc.utexas.edu/utda/vmc/>, 2017.
35. University of Melbourne, Australia, "Context-aware management for Smart Cities," 2016.
36. San Diego Port Authority, CA, "Context-aware management for Smart Cities," 2016.
37. CalTrans, CA, "Context-aware management for Smart Cities," 2016.
38. Cymer, CA, "System Energy Efficiency," 2016.
39. Hitachi, CA, "System Energy Efficiency," 2016.
40. Hewlett-Packard, CA, "System Energy Efficiency for IoT Applications," 2016.
41. IBM, CA, "Context-awareness for healthcare applications," 2016.
42. SDGE, CA, "Sensors to Grid," 2016.
43. Leidos, CA, "Improving Energy Efficiency in Smart Cities by Leveraging Context Awareness," 2016.
44. LG, CA, "System Energy Efficiency," 2016.
45. MediaTek, CA, "Context and the IoT," 2016.
46. Qualcomm, CA, "Approximate computing for IoT," 2016.
47. Raytheon, CA, "Improving system energy efficiency by leveraging context awareness," 2016.
48. UC Berkeley, "Hierarchical and context-aware management for the Smart Cities," 2015.
49. Arizona State University, AZ, "Context-aware energy and thermal management in systems," 2015.
50. University of Arizona, AZ, "Context-aware energy and thermal management in mobile systems," 2015.
51. SNU-UCSD-SDG&E MicroGrid (MG) Workshop, CA, "Leveraging Context for the Smart Cities," 2016.
52. Texas Instruments, TX, "Context-aware energy and thermal management," 2015.
53. Carnegie Mellon University, PA, "Distributed Control of Buildings Connected to a Smart Grid," 2015.
54. Fujitsu, CA, "Energy efficient datacenters and networks," 2015.
55. Intel, OR, "Distributed optimization for Smart Grid applications," 2015.
56. Intel, OR, "Approximate computing for Internet of Things applications," 2015.
57. University of Split, Croatia, "From sensors to smart cities," 2015.
58. Google, CA, "Context-aware energy management for residential applications," 2015.
59. Intel, OR, "Context and the IoT," 2015.
60. Intel, AZ, "Leveraging context-awareness for improving system energy efficiency," 2015.
61. Raytheon, Washington DC, "Ontology-Driven Context-Aware IoT Applications," 2015.
62. Intel, CA, "System Energy Efficiency," 2015.
63. Samsung, CA, "System energy efficiency," 2014.
64. IBM, NY, "Improving system energy efficiency by leveraging context awareness," 2014.
65. EPFL, Switzerland, "Context for distributed system energy efficiency," 2014.
66. Politecnico di Torino, Italy, "Context-aware energy and thermal management in mobile systems," 2014.
67. Politecnico di Milano, Italy, "Context-aware energy and thermal management in mobile systems," 2014.
68. EPFL, Switzerland, "Future Smart Environments," 2014.
69. University of Zagreb, Croatia, "Context-aware energy and thermal management in systems," 2014.
70. University of Split, Croatia, "Context-aware energy management for the Smart Grid applications," 2014.
71. Huawei, CA, "Datacenter energy efficiency," 2014.
72. Samsung, CA, "Context-aware energy and thermal management in mobile systems," 2014.
73. University of Maryland, "Context-aware energy and thermal management in mobile systems," 2014.

Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

74. Raytheon, Washington DC, "Distributed energy management for the grid applications," 2013.
75. Intel, OR, "Distributed sensing and control for the smart grid applications," 2013.
76. Qualcomm, CA, "Modeling context in residences," 2013.
77. Qualcomm, CA, "Reliability management," 2013.
78. Intel, OR, "Energy and thermal management in mobile systems," 2013.
79. Panasonic, CA, "Using distributed batteries for energy management in residences," 2013.
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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

(858) 534-4868

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Tajana Šimunić Rosing

tajana@ucsd.edu

<http://www.cse.ucsd.edu/~trosing/>

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APPLICATION NUMBER	FILING OFFICE DATE	DEPART MENT	FILED RECD	ATTY/AGENT NO	POT CLAIMS	IND CLAIMS
61/134,714	07/14/2008		105			

CONFIRMATION NO. 2857

FILING RECEIPT



0000000031227222

Date Mailed: 07/29/2008

John Steinberg
 EcoFactor, Inc.
 423 Broadway #801
 Millbrae, CA 94030

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

John Douglas Steinberg, Millbrae, CA;

Power of Attorney: None

If Required, Foreign Filing License Granted: 07/28/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/134,714**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

System and method for using a graphic interface as an occupancy sensor for an energy management system

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Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international

page 1 of 3

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Exhibit K

patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
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07/15/2008 REMITTANCE 00000103 \$1134714

01 FC:2005 105.00 DP

PTO-1556
(5/87)

U.S. PTO
61/134714
07/14/2008

Doc Code: TR.PROV

Document Description: Provisional Cover Sheet (SB16)

PTO/SB16 (04-07)

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Provisional Application for Patent Cover Sheet

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Inventor(s)

Inventor 1

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Given Name	Middle Name	Family Name	City	State	Country
John	Douglas	Steinberg	Millbrae	CA	US

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button.

Add

Title of Invention

SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Attorney Docket Number (if applicable)

Correspondence Address

Direct all correspondence to (select one):

☐ The address corresponding to Customer Number☒ Firm or Individual Name

Firm or Individual Name 1

John Steinberg

Firm or Individual Name 2

EcoFactor, Inc.

Mailing Address of Applicant:

Address 1	423 Broadway #801		
Address 2			
City	Millbrae	State/Province	CA
Postal Code	94030	Country	US
Phone	650 873 0829		

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.☐ Yes, the name of the U.S. Government agency and the Government contract number are:

Doc Code: TR.PROV

Document Description: Provisional Cover Sheet (SB16)

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Entity Status

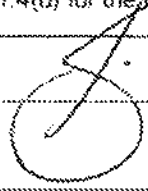
Applicant claims small entity status under 37 CFR 1.27

☒ Yes, applicant qualifies for small entity status under 37 CFR 1.27☐ No**Warning**

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature				Date (YYYY-MM-DD)	7/11/08
First Name	John	Last Name	Steinberg	Registration Number (If appropriate)	

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2. (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Applicant Information:

Applicant 1				
Applicant Authority <input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Party of Interest under 35 U.S.C. 118
If applicant is not an inventor, indicate the authority to file for the patent on behalf of the inventor, the inventor is:				
Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Douglas	Steinberg	
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Millbrae	State/Province	CA	Country of Residence
				US
City		Country Of Residence:		
Active Military Service in				
Citizenship under 37 CFR 1.41(b)				
		US		
Mailing Address of Applicant:				
Address 1		423 Broadway #801		
Address 2				
City	Millbrae	State/Province	CA	
Postal Code		Country		
If the representative for the inventor is an Organization check here. <input type="checkbox"/>				
Organization Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
Residence Information of the Inventor's Representative:				
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City		State/Province		Country of Residence
City		Country Of Residence:		
Active Military Service in				
Citizenship under 37 CFR 1.41(b)				
Mailing Address of the Inventor's Representative:				
Address 1				
Address 2				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		
		Application Number		
Title of Invention	SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
City		State/Province		
Postal Code		Country		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.				
<input type="button" value="Add"/>				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).				
<input checked="" type="checkbox"/> An Address is being provided for the correspondence information of this application.				
Customer Number				
Name 1	John	Name 2	Steinberg	
Address 1	423 Broadway #801			
Address 2				
City	Millbrae	State/Province	CA	
Country		Postal Code	94030	
Phone Number	650 873 0829	Fax Number		
Email Address	john@ecofactor.com	<input type="button" value="Add Email"/>		<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
Attorney Docket Number		Small Entity Status Claimed <input checked="" type="checkbox"/>		
Application Type	Provisional			
Subject Matter	Utility			
Suggested Class (if any)		Sub Class (if any)		
Suggested Technology Center (if any)				
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)		
Plant Submissions Only:				
Latin Name		Variety Denomination Name		

Publication Information:

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

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Domestic Benefit/National Stage Information:

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Prior Application Status				<input type="button" value="Remove"/>
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number
				Issue Date (YYYY-MM-DD)
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Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
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Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Assignee Information:

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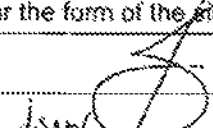
Assignee 1

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

If the Assignee is an Organization check here. <input checked="" type="checkbox"/>				
Organization Name	EcoFactor, Inc.			
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information:				
Address 1	423 Broadway #801			
Address 2				
City	Millbrae	State/Province	CA	
Country	US	Postal Code	94030	
Phone Number	650 873 0829	Fax Number		
Email Address	john@ecofactor.com			
Additional Assignee Data may be generated within this form by selecting the Add button.				

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.				
Signature			Date (YYYY-MM-DD)	7/1/08
First Name	John	Last Name	Srinivasan	Registration Number

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SYSTEM AND METHOD FOR USING A GRAPHIC INTERFACE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Background of the Invention

Field of the Invention

This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

Background

Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry

to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals – ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can

shift between multiple present temperatures at different times without real-time involvement of a human being.

Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at ± 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint – that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally

effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by those systems. Hotel guests often turn the air conditioner to a low temperature setting and then leave the room for hours at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system.

Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor detects motion (which is assumed to coincide with the return of the guest), the HVAC system resets to the guest's chosen setting.

Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family

residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

Summary of the Invention

In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with

one or more computers which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the thermostats to their HVAC systems. The server also monitors and logs activity on the computer associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

Brief Description of the Drawings

Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

Figure 3 shows an embodiment of the website to be used as part of the subject invention.

Figure 4 shows a high-level schematic of the thermostat used as part of the subject invention.

Figure 5 shows one embodiment of the database structure used as part of the subject invention.

Figure 6 shows the browser as seen on the display of the computer used as part of the subject invention.

Figure 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

Detailed Description

Figure 1 shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

When a user of the subject invention wishes to access information on network 102, the user initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn, establishes a

communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors

may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network.

Computers 104 can also be microprocessor- controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices.

The storage medium may comprise any method of storing information. It may comprise random access memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data.

Computers 104 and 106 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like.

Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

Figure 2 illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 110 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served as web pages and viewed by computers 104, as well as databases containing information used by the servers.

In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in **Figure 3**. Those components may include a means to enter temperature settings 202, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

Figure 4 shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a

thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254, memory 256, a display 258, a power source 260, a relay 262, which turns the HVAC system on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of

the home, the solar orientation of the home, the location of the thermostat in the home, the user's preferred temperature settings, whether the user is a participant in a demand reduction program, etc.

As shown in Figure 3, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow changing the settings of the temperature for all periods with a single gesture such as a mouse click.

Figure 6 represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, alter the overall programming of the

an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to

watch children's programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you, Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "No" button 1206.

Figure 7 represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 300 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccupied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for

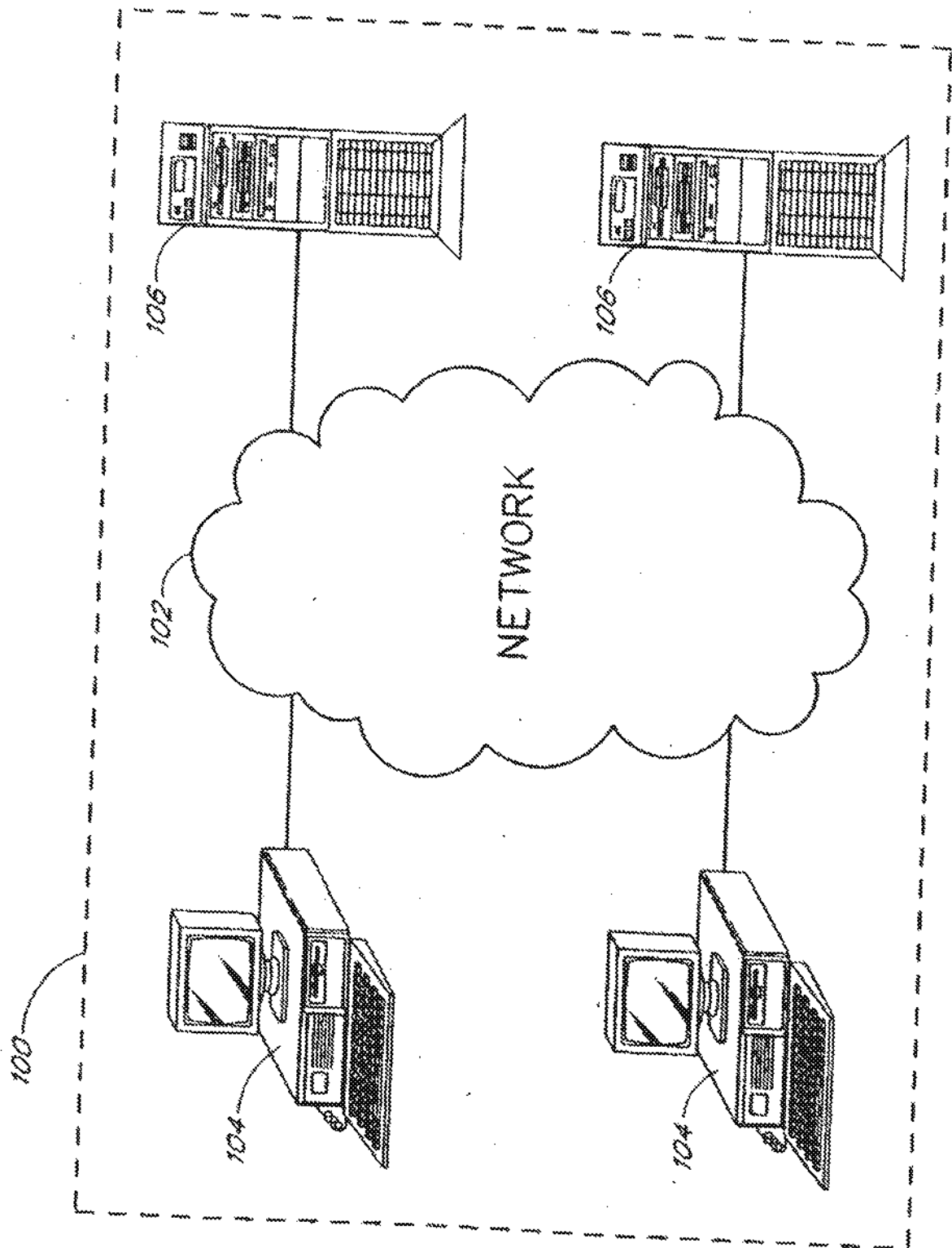


FIG. 1

Fig. 2

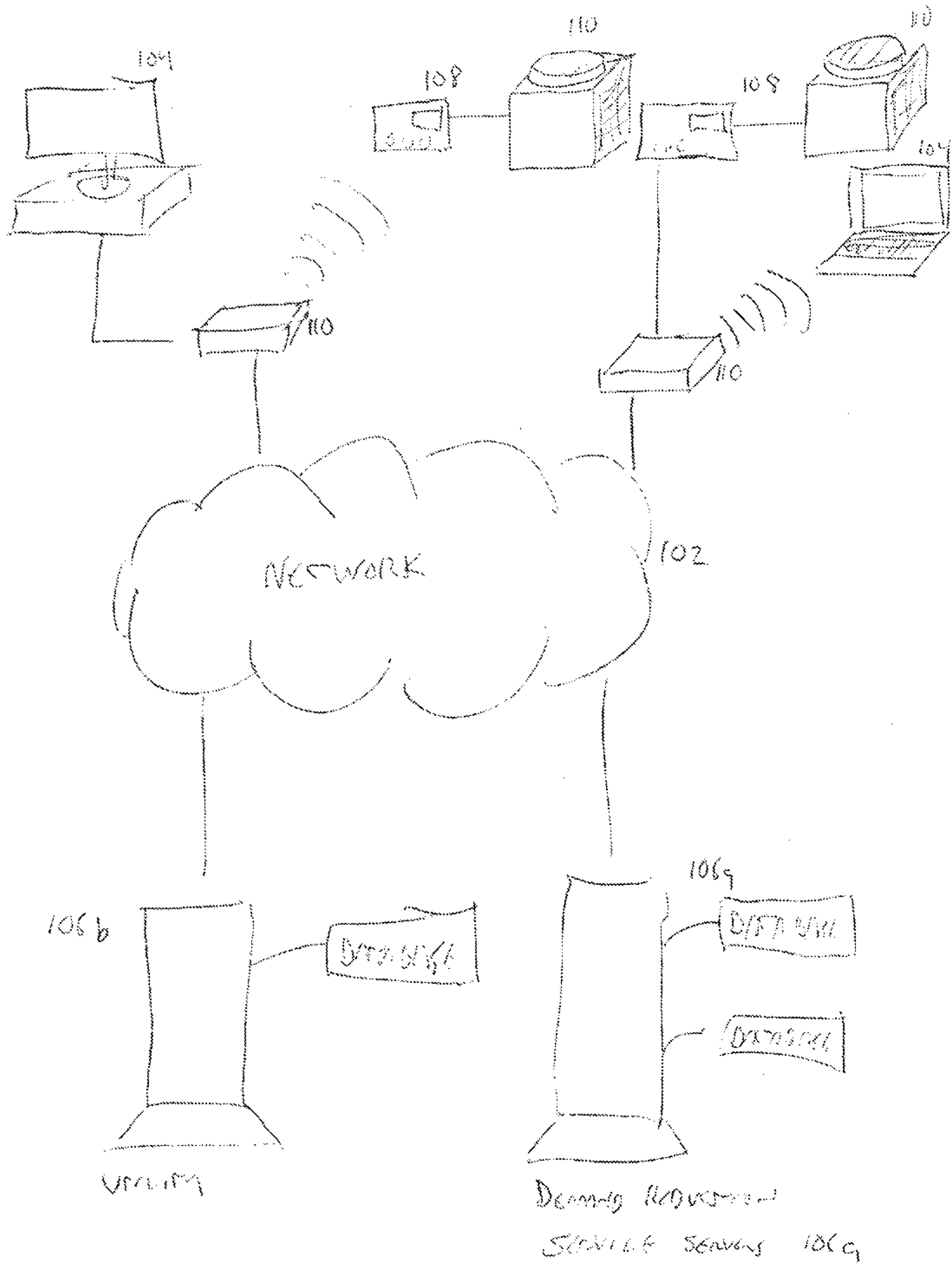


FIG 3

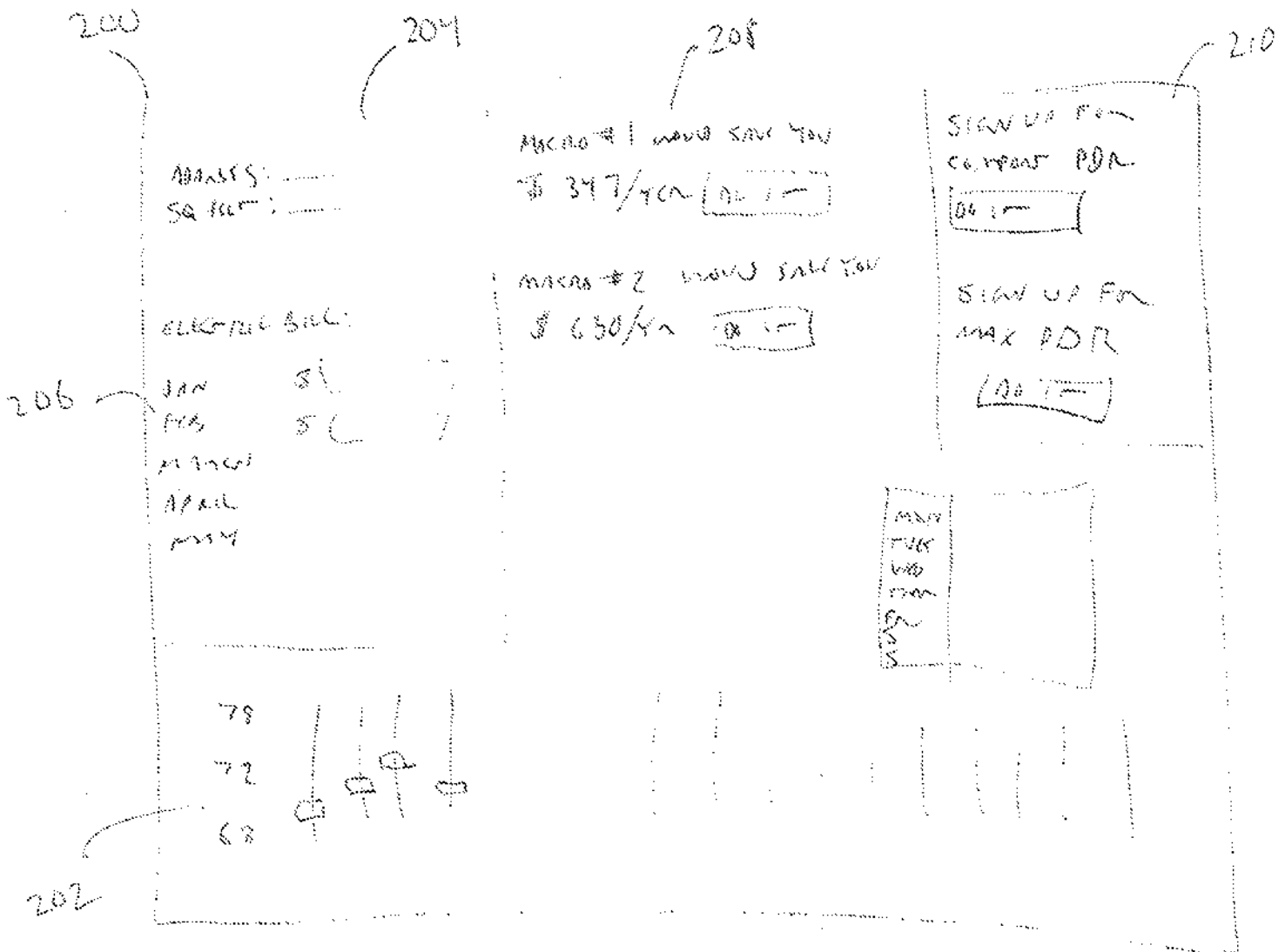


FIG 4

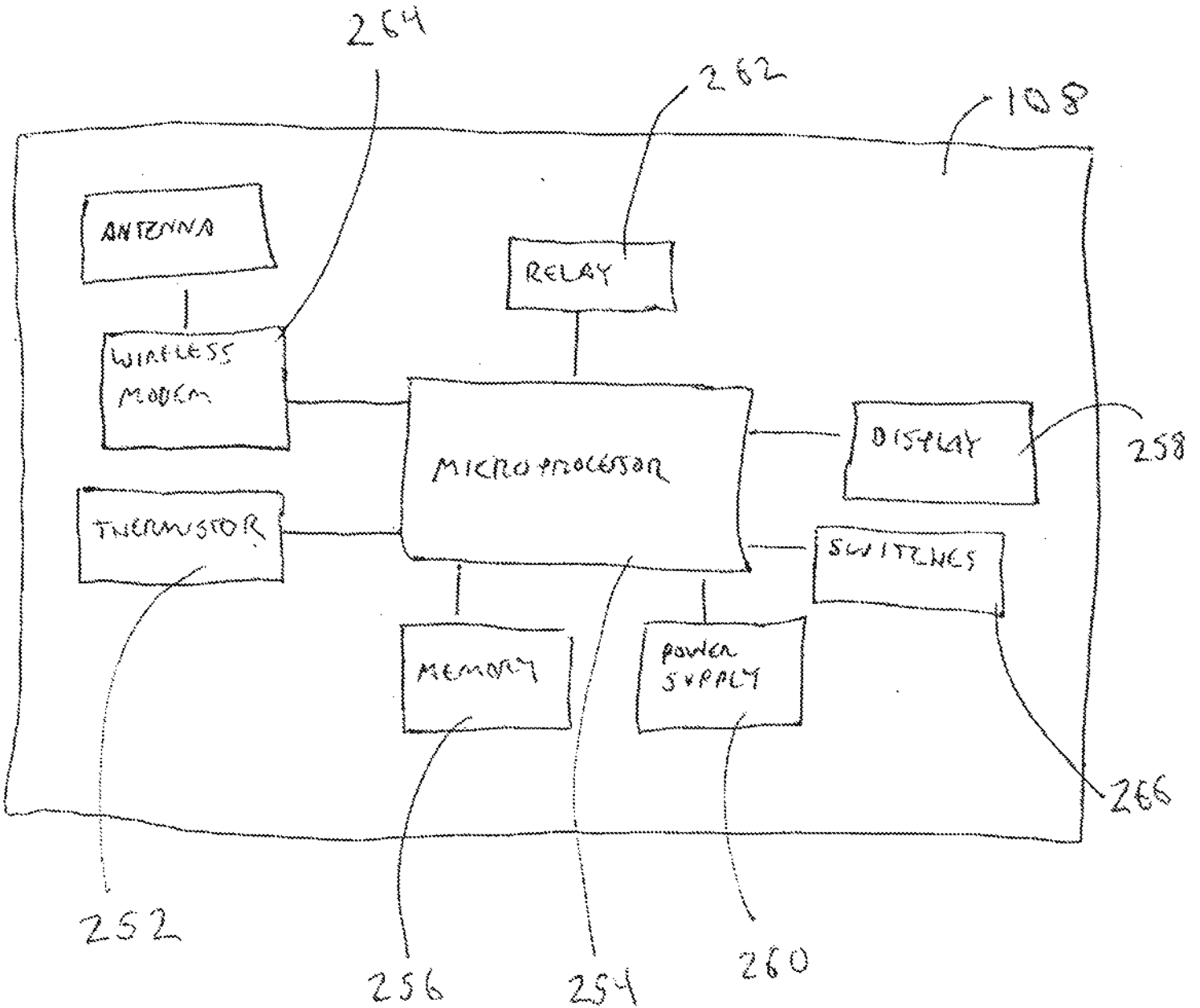
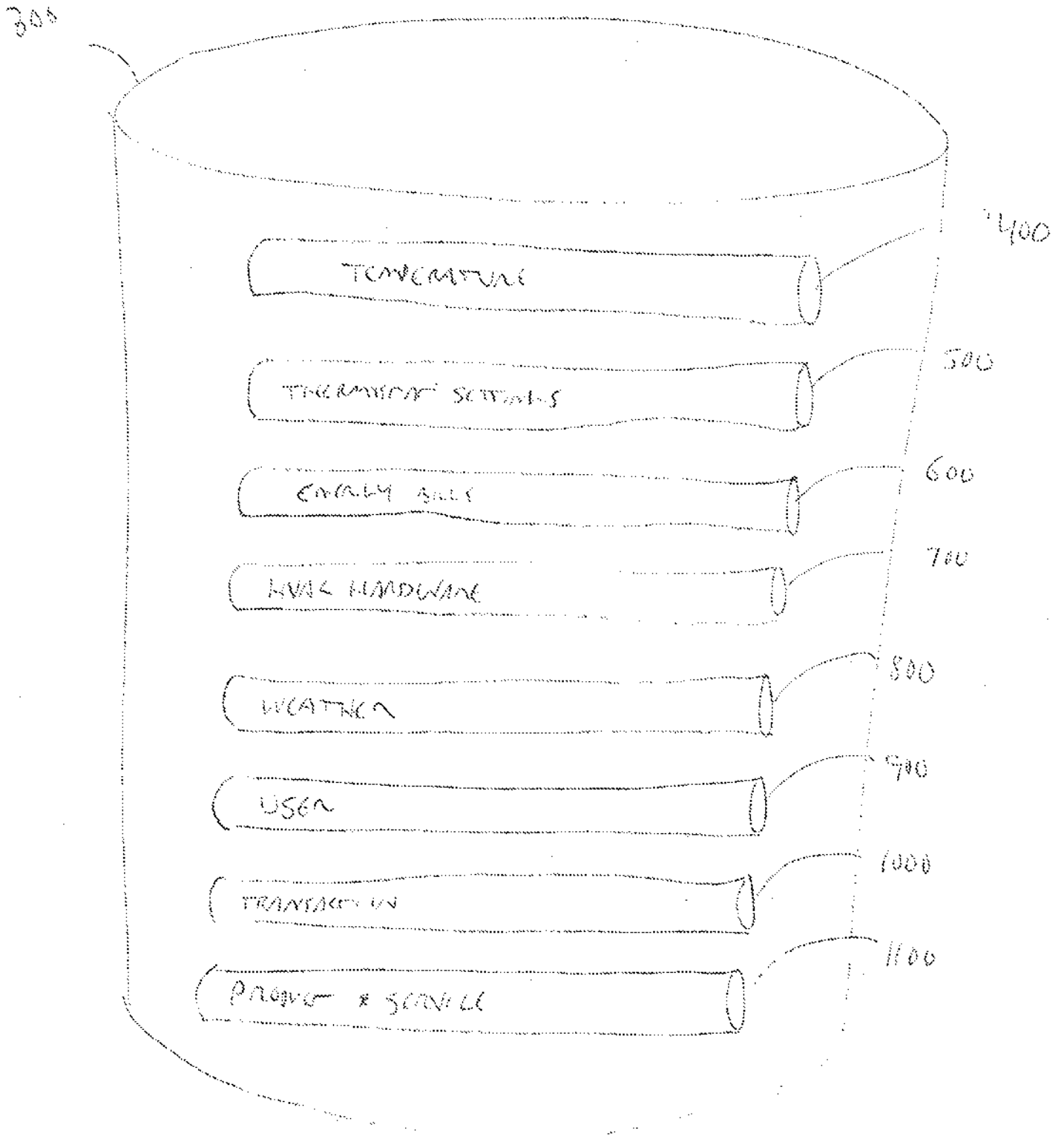
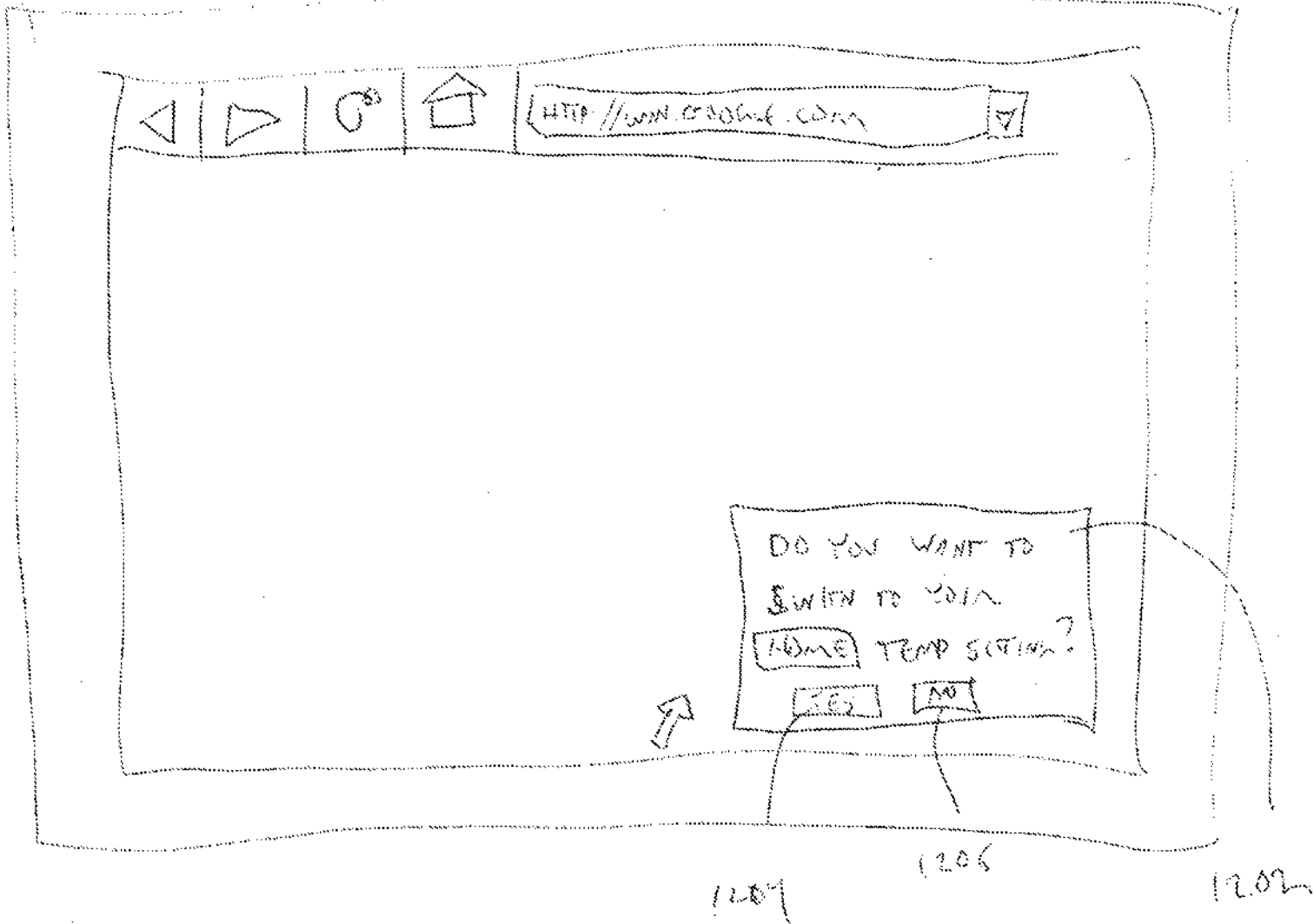


FIG 5



1200
File 6



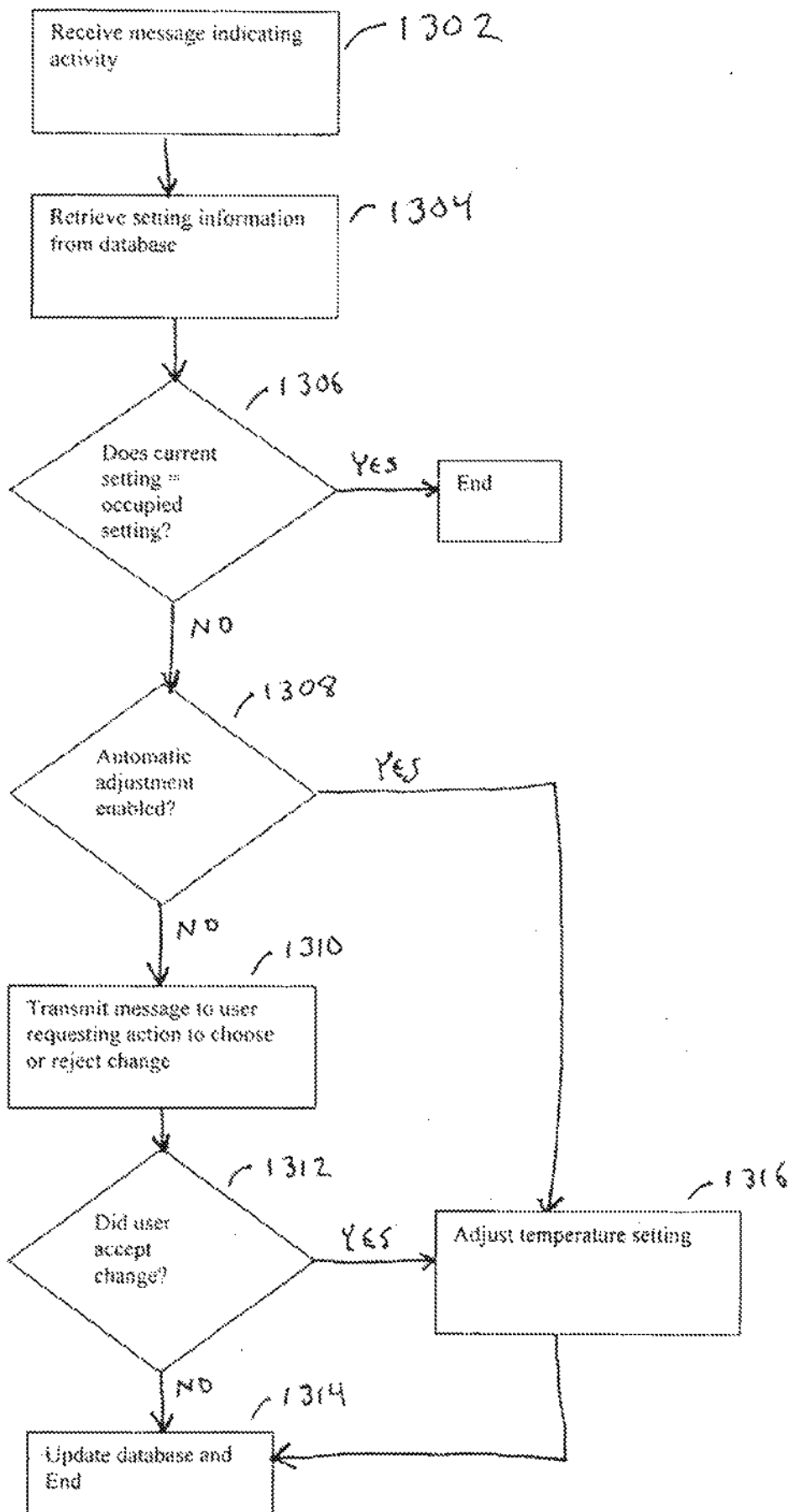
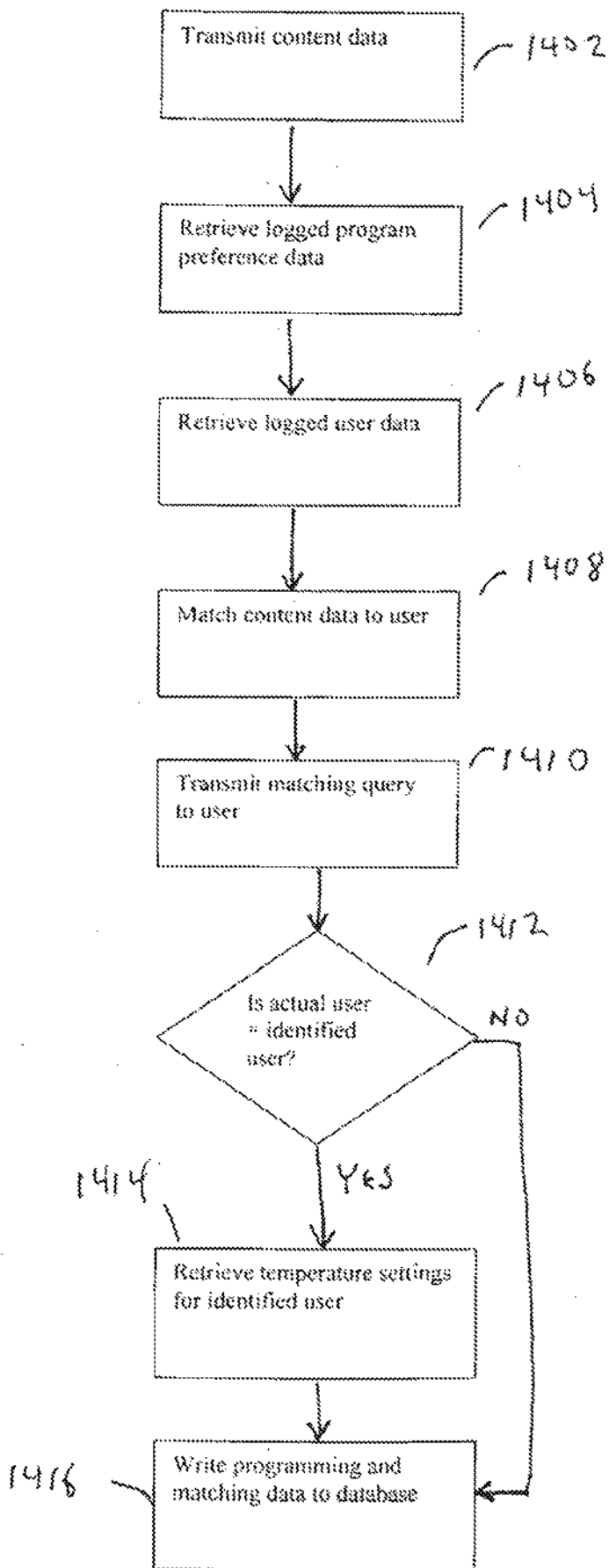


Fig 8



Doc Code: DIST.E.FILE

Document Description: Electronic Terminal Disclaimer - Filed

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Department of Commerce

Electronic Petition Request	TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT
Application Number	16374085
Filing Date	03-Apr-2019
First Named Inventor	John Steinberg
Attorney Docket Number	EFACT-011C3
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

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☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
EcoFactor, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

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Signature	/John R. King/
Name	John R. King

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Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	16374085			
Filing Date:	03-Apr-2019			
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First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Evelyn Salcido			
Attorney Docket Number:	EFACT.011C3			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
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Application No.: 16374085

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Applicant/Patent under Reexamination: Steinberg

Electronic Terminal Disclaimer filed on June 12, 2019

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

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16/374,085	01/14/2020	10534382	EPACT.011C3	6894

20005 7590 12/24/2019

KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

John Douglas Steinberg, Millbrae, CA;
 Ecotactor, Inc., Redwood City, CA;

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12/09/2019

ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 11.26.2019 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

Bernice Crittenden

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374,085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
SHEET 1 OF 1		Examiner Ojha, Ajay
		Attorney Docket No. EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	10,316,581	06/11/2019	Nagel et al.	
	2	10,339,232	07/02/2019	Hoff	
	3	10,393,398 (EFACT.013C5)	08/27/2019	Steinberg	
	4	2010/0070084	03/18/2010	Steinberg et al.	
	5	2010/0262299	10/14/2010	Cheung et al.	
	6	2011/0282504	11/17/2011	Besore et al.	
	7	2012/0065789	03/15/2012	Scelzi et al.	
	8	2012/0091804	04/19/2012	Altonen et al.	
	9	2012/0203379	08/09/2012	Sloo et al.	
	10	2012/0234932	09/20/2012	Okamoto et al.	
	11	2012/0271576	10/25/2012	Kamel et al.	
	12	2014/0277795	09/18/2014	Matsuoka et al.	
	13	2015/0053779	02/26/2015	Adamek et al.	
	14	2015/0159928	06/11/2015	Hancock	
	15	2016/0195865	07/07/2016	Shiel	
	16	2016/0290668	10/06/2016	Taylor et al.	
	17	2017/0329357	11/16/2017	Torres et al.	
	18	2019/0234810	08/01/2019	Steinberg et al.	
	19	2019/0285299	09/19/2019	Steinberg	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

31773113

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.003

Electronic Patent Application Fee Transmittal				
Application Number:		16374085		
Filing Date:		03-Apr-2019		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Amy Durrant		
Attorney Docket Number:		EFACT.011C3		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1000

Electronic Acknowledgement Receipt

EFS ID:	37868185
Application Number:	16374085
International Application Number:	
Confirmation Number:	6894
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Melissa Ramirez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C3
Receipt Date:	26-NOV-2019
Filing Date:	03-APR-2019
Time Stamp:	18:10:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1000
RAM confirmation Number	E2019API11176607
Deposit Account	111410
Authorized User	Melissa Ramirez

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

B.006

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	EFACT-011C3_issuefee.pdf	1647179	no	1
			e92710ac2fa585eaddc41a20cd213d65c888c66c		
Warnings:					
Information:					
2	Miscellaneous Incoming Letter	EFACT-011C3_comments.pdf	84596	no	2
			769f7fcd4c813d15c008c8460c9dcd661703194de		
Warnings:					
Information:					
3		EFACT-011C3_IDS.pdf	127529	yes	2
			60a3f4ac31cd53c26d67c1770aa9cdac47d10cc		
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Transmittal Letter	1	1		
	Information Disclosure Statement (IDS) Form (SB08)	2	2		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30697	no	2
			110527f15c3baac725dffc70671c8a856d472297a		
Warnings:					
Information:					
Total Files Size (in bytes):			1890001		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B - FEE TRANSmittal

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence, including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address on file, and unless corrected below or directed otherwise in Block 1, by indicating a new correspondence address, and/or (b) indicating a separate "FEE ADDRESS" for transmission for notification.

A certificate of mailing can only be used for domestic mailings of the

Patent Transmittal. This certificate cannot be used for any other non-emitting papers. Other additional papers, such as an assignment or formal drawing, must have its own certificate of mailing or transmittal.

Date: 11/26/2019 Time: 02:04:29 PM

KNOBBE MARTENS OLSON & BEAR LLP
2940 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571)-273-2885, on the date below:

_____ Type or print name
_____ Signature
_____ Date

APPLICATION NO.	FILED DATE	FIRST NAME(S) OF INVENTOR	ATTORNEY (FIRM) NO.	CORRESPONDENCE NO.
012/34 085	06/07/2019	John Douglas Strubbery	BEAR, F.B.I.C.	6984

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTRY STATUS	RIGHTS FEE	PUBLICATION FEE	PREP. PAID IN FEE	TOTAL FEES, C/F	DATE FEE
non-provisional	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	12/04/2019

EXAMINER	APPL. NO.	CLASS. NO. & CLASS.
ORR, AJAY	2874	70D 270000

1. Change of correspondence address of individual or "Firm Address" (PTO CFR 1.532).

☒ Change of correspondence address (or Change of Correspondence Address form PTO/CBP 122) attached.

☐ "Firm Address" indication (or "Firm Address" indication form PTO/CBP 122). Key (1) (4) or (5) must be attached. Use of a Customer Number is required.

2. For printing on the patent front page, list:

(1) The names of up to 10 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 10 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. **Knobbe, Martens,**2. **Olson & Bear, LLP**

3. _____

3. ASSIGNEE NAME AND RESIDENT DATA TO BE PRINTED ON THE PATENT (print or type)

NOTE: If, when an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recording, as set forth in 37 CFR 1.31 and 37 CFR 1.31 (a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

EcoFactor, Inc.

(B) RESIDENCE CITY AND STATE OR COUNTRY

Palo Alto, CAPlease check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private entity ☐ Government4a. Fee(s) submitted: ☒ Issue Fee ☐ Publication Fee (if required): ☐ Advance Order - R & D Copies

4b. Mailed and Payment: (Please first verify any previously paid fee claims shown)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO 3038)

☒ The Director is hereby authorized to charge _____ any deficiency, or credit any overpayment to Deposit Account No. **11-1410**

5. Change in Entity Status (from status indicated above)

☐ Applicant satisfying micro entity status. See 37 CFR 1.15.

☐ Applicant satisfying small entity status. See 37 CFR 1.17.

☐ Applicant changing to regular individual status.

NOTE: About a valid certification of Micro Entity Status (see forms PTO/SB 15A and 15B), fees for payment to the micro entity status will not be assessed in the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.2 for signature requirements and coordination.

Authorized Signature: **John R. King** Date: **November 26, 2019**
 Typed or printed name: **John R. King** Registration No.: **34,362**

EFACT.011C3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Filed	: April 3, 2019
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ajay Ojha
Art Unit	: 2824
Conf. No.	: 6894

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Statement of Reasons for Allowance in the Notice of Allowance mailed September 4, 2019, Applicant respectfully submits the following comments.

Applicant respectfully disagrees with the Examiner's statement of reasons for allowance to the extent that the limitations recited by the Examiner are not present in all of the claims. Also, to the extent that there is any implication that the patentability of the claims rests on the recitation of a single feature, Applicant respectfully disagrees with the Examiner's Statement because it is the combination of features that makes the claims patentable.

Applicant submits that the claims of the present application are allowable because each of the claims recites a combination of features that are not taught or suggested by the prior art.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: November 26, 2019

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

31773031

INFORMATION DISCLOSURE STATEMENT

First Inventor : John Douglas Steinberg
App. No. : 16/374,085
Filed : April 3, 2019
For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A
SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner : Ajay Ojha
Art Unit : 2824
Conf. No. : 6894

Mail Stop Issue Fee

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after the mailing date of a final action or after the mailing date of a Notice of Allowance. Please place these references in the file in accordance with 37 CFR 1.97(i).

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: November 26, 2019

By: John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

20995 7500 09/04/2019
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

EXAMINER

OJHA, AJAY

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 09/04/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EFACT011C3	6894

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	12/04/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEES) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

20995 7590 09/04/2019
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EPACT.011C3	6894

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPLX. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	12/04/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
OIHA, AJAY	2824	700-278000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47: Rev 03-09 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

- ☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No.

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature

Date

Typed or printed name

Registration No.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EPACT011C3	6894
20995	7500	09/04/2019	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			DIHA, AJAY	
2040 MAIN STREET			ART UNIT	
FOURTEENTH FLOOR			PAPER NUMBER	
IRVINE, CA 92614			2824	
DATE MAILED: 09/04/2019				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
 (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

B-016

Notice of Allowability

Application No.

18/374,085

Applicant(s)

Steinberg, John Douglas

Examiner

AJAY QJHA

Art Unit

2824

AIA (FITE) Status

No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL 85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1306.

1. ☒ This communication is responsive to Amendment/Req. Reconsideration-After Non-Final Reject - 08/02/2019.
☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-11 and 14-22. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events_pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
 Identifying indicia such as the application number (see 37 CFR 1.84(e)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notices of References Cited (PTO-892)
 2. ☒ Information Disclosure Statements (PTO/SB-08),
 Paper No./Mail Date _____
 3. ☐ Examiner's Comment Regarding Requirement for Deposit
 of Biological Material _____
 4. ☐ Interview Summary (PTO-413),
 Paper No./Mail Date _____
5. ☐ Examiner's Amendment/Comment
 6. ☒ Examiner's Statement of Reasons for Allowance
 7. ☐ Other _____

/AJAY QJHA/

Primary Examiner, Art Unit 2824

Application/Control Number: 16/374,085
Art Unit: 2824

Page 2

DETAILED ACTION

General Remarks

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.
3. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
4. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
5. Applicants seeking an interview with the examiner, including **WebEx Video Conferencing**, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
6. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 19.
 - b. Amended: 1, 16, 19 and 20.
 - c. Cancelled: 12-13.
 - d. New: 21-22.
 - e. Pending: 1-11 and 14-22.

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IDS

7. Applicant's IDS(s) submitted on 08/02/2019 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has/have considered by the examiner and made of record.

Response to Arguments

8. In view of claim amendments incorporating allowable subject matter and applicant's arguments, see page(s) 8-19, filed 08/02/2019, with respect to claim(s) 1-11 and 14-20 have been fully considered and are persuasive. The rejection of claim(s) 1-11 and 14-20 has been withdrawn. New claims introduced by the applicant incorporate allowable subject matter, hence are being allowed.

Allowable Subject Matter

9. **Claim(s) 1-11 and 14-22 are allowed.**

10. The following is an examiner's statement of reasons for allowance:

The closest prior art to the present invention is Podgorny (US 20080281472 A1) and Winick (US 20050270151 A1).

Podgorny discloses a building automation system, and, more particularly, to an Internet-centric, open, extensible software and hardware framework supporting all aspects of control and monitoring of a smart building ecosphere. The present invention further relates to an "intelligent," real-time control system capable of both autonomous process control and interaction with system users and system administrators, which is configured to accommodate functional extensions and a broad array of sensors and control devices. The system allows individuals to communicate, monitor and adjust their personal environmental preferences (temperature, light, humidity, white noise, etc.) much like they would in an automobile, via the Internet. The system is equipped with an occupancy sensor that recognizes the presence and identity of the individual. A built-in expert system can make decisions based on data from

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multiple sources so that the system can alter its activity to conserve energy while maintaining users' comfort.

Winick discloses an interconnected wireless HVAC (heating, ventilation, air conditioning) system and wireless security system, which are interconnected and communicate with each other through the use of a common wireless technology, including the same selected frequency, modulation and a set of common protocols. The Wireless HVAC system includes wireless thermostats, which can communicate with and control both the HVAC system and the security system, and the wireless security system includes wireless controls or keypads, which can communicate with and control both the security system and the HVAC system. The universal wireless infrastructure can be expanded to provide communication or control of additional user or manufacturer installed wireless devices or systems through the universal wireless home infrastructure.

Re: Independent Claims 1 and 19 (and dependent claim(s) 2-11, 14-18 and 20-22), there is no teaching or suggestion in the prior art of record to provide:

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory; the first processor with circuitry and code designed to execute instructions to communicate with the memory; wherein the memory is configured to store historical values of the first data and second data.

Missing elements in the closest art gives rise to the innovation in the current invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is 571-272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/
Primary Examiner, Art Unit 2824
ajay.ojha@uspto.gov

<p><i>Index of Claims</i></p> 	<p>Application/Control No.</p> <p>16/374,085</p>	<p>Applicant(s)/Patent Under Reexamination</p> <p>Steinberg, John Douglas</p>
	<p>Examiner</p> <p>AJAY GUHA</p>	<p>Art Unit</p> <p>2824</p>

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected


[illegible]

Issue Classification 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC						
Symbol					Type	Version
G05D	/	23	/	00	F	2013-01-01
G08B	/	1	/	08	I	2013-01-01
G05D	/	23	/	1902	I	2013-01-01
G05B	/	15	/	02	I	2013-01-01
G06N	/	7	/	005	I	2013-01-01
F24F	/	11	/	30	I	2018-01-01
F24F	/	11	/	62	I	2018-01-01
F24F	/	11	/	70	I	2018-01-01
F24F	/	2120	/	10	A	2018-01-01
F24F	/	2120	/	12	A	2018-01-01
F24F	/	2120	/	14	A	2018-01-01
F24F	/	2140	/	60	A	2018-01-01
F24F	/	2120	/	20	A	2018-01-01
F24F	/	11	/	63	A	2018-01-01
F24F	/	11	/	56	A	2018-01-01
F24F	/	11	/	46	A	2018-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		
	/		/		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/AJAY OJHA/ Primary Examiner, Art Unit 2824	20 August 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2 and 7

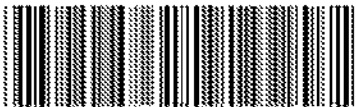
Issue Classification 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

INTERNATIONAL CLASSIFICATION			
CLAIMED			
G05D	/	23	/ 00
G08B	/	1	/ 08
NON-CLAIMED			
	/		/

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS


CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/AJAY OJHA/ Primary Examiner, Art Unit 2824 (Primary Examiner)	20 August 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2 and 7

Issue Classification 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

<input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/AJAY OJHA/ Primary Examiner, Art Unit 2824 (Primary Examiner)	20 August 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2 and 7

Search Notes 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	05/03/2019	AO
Refreshed search.	07/10/2019	AO
Refreshed search.	08/20/2019	AO


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search.	05/03/2019	AO
Refreshed search. See search history.	07/10/2019	AO
NF2	07/11/2019	rte
Refreshed search.	08/20/2019	AO

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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<i>Search Notes</i> 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
G05D	G05D23/00; G05D23/1902; G05D23/1902;	08/20/2019	AO
G08B	G08B1/08; G05B15/02;	08/20/2019	AO
F24F	F24F11/006; F24F11/70; F24F11/62; F24F11/30; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63 ; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	08/20/2019	AO

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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Bibliographic Data

Application No: 16/374,085

Foreign Priority claimed: ☐ Yes ☒ No35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /AJAY OJHA/

Examiner's Signature

Initials

Title: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/03/2019	700	2824	EFACT.011C3
RULE			

APPLICANTS

EcoFactor, Inc., Redwood City, CA, UNITED STATES

INVENTORS

John Douglas Steinberg Millbrae, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 15002791 01/21/2016 PAT 10289131

15002791 is a CON of 13470074 05/11/2012 PAT 9244470

13470074 is a CON of 12502064 07/13/2009 PAT 8180492

12502064 has PRO of 61134714 07/14/2008

FOREIGN APPLICATIONS**IF REQUIRED, FOREIGN LICENSE GRANTED****

04/17/2019

STATE OR COUNTRY

UNITED STATES

ADDRESS

KNOBBE MARTENS OLSON & BEAR LLP

2040 MAIN STREET

FOURTEENTH FLOOR

IRVINE, CA 92614

UNITED STATES

FILING FEE RECEIVED

\$2.855

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L4	0	(11/170403) APP	USPAT; USOCR	OR	ON	2019/08/20 18:08
S1	149	! ("STEINBERG") near3 ("John").INV.	US- PQFUB; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	("EcoFactor").AS,AANM.	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 09:40
S3	46863	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G06B15/02; G06N7/005; G05D25/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND user\$1 AND wireless).CLM.	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:03
S5	15	("9244470")	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:11
S6	9	("9244470")	USPAT	OR	ON	2018/02/07 10:12
S7	25	("20040117335" "20090066596" "20150025691" "5700224" "20130173064" "20040133314" "5346074" "7669307" "8850348" "5057648" "20140316581" "20150120235" "7226670" "20130178985").PN.	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:05
S8	4	("20080281472" "20090066596")	US- PQFUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:12

B.029

S10	32	(US-20010025349-\$ US-20040117330-\$ US-20040133314-\$ US-20080083834-\$ US-20090005070-\$ US-20090018673-\$ US-20090057428-\$ US-20090062970-\$ US-20090271013-\$ US-20130073094-\$ US-20170241662-\$ US-20170336090-\$ US-20180087793-\$ US-20180087795-\$ US-1234567-\$ US-4270683-\$ US-4702305-\$ US-4702413-\$ US-5297838-\$ US-5454511-\$ US-5706190-\$ US-5839854-\$ US-6216956-\$ US-6223544-\$ US-6449534-\$ US-6454177-\$ US-6845918-\$ US-6981383-\$ US-7983795-\$ US-9709292-\$ US-9939333-\$). DID.	US- PGPUB; USPAT; USOCR; PPRS; EPO; ISM TDB	OR	ON	2018/06/11 18:22
S11	31	("0015610" "20010025349" "20040117330" "20040133314" "20080083834" "20090005070" "20090018673" "20090057428" "20090062970" "20090271013" "20130073094" "20170241662" "20170336090" "20180087793" "20180087795" "4270683" "4702305" "4702413" "5297838" "5454511" "5706190" "5839854" "6216956" "6223544" "6449534" "6454177" "6845918" "6981383" "7983795" "9709292" "9939333"). PNL.	US- PGPUB; USPAT	OR	ON	2018/06/11 14:20
S12	9	("20160061474" "9244470" "9279554" "20080283865" "20080083234" "20090065508"). PNL.	US- PGPUB; USPAT; USOCR; PPRS; EPO; ISM TDB	OR	ON	2018/06/11 16:03
S13	3	(WO-2009036764-\$). DID.	US- PGPUB; USPAT; USOCR; PPRS; EPO; ISM TDB	OR	ON	2018/06/11 18:38
S14	0	(desktop ADJ us\$3 WITH control ADJ3 (temperature))	US- PGPUB; USPAT; USOCR; PPRS; EPO; ISM TDB	OR	ON	2018/06/11 18:38
S15	18	(desktop ADJ us\$3 WITH control WITH environment)	US- PGPUB; USPAT; USOCR; PPRS; EPO; ISM TDB	OR	ON	2018/06/11 18:43
S16	147	(desktop ADJ usage)	US- PGPUB; USPAT; USOCR;	OR	ON	2018/06/11 18:49

			FPRS; EPO; IBM TDB			
S17	0	S16 AND (desktop ADJ usage WITH air\$1conditioning)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:50
S18	11	S16 AND (desktop ADJ usage WITH environment\$2)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:51
S19	0	S16 AND (smart SAME room ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:55
S20	0	(smart SAME room ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:56
S21	0	(smart ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:58
S22	0	(wire\$1less ADJ device ADJ aware WITH thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:58
S23	2024	(smart ADJ thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:00
S24	0	S23 AND (smart ADJ thermostat) SAME t(computer desktop TV) ADJ2 usage)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:01
S25	17235	(occupant NEAR10 detect\$3)	US- PGPUB;	OR	ON	2018/06/11 19:05

B.031

			USPAT; USCOR; FPRS; EPO; ISM, TDS			
S27	13997	(occupant NEARS detect\$3)	US- PGFUE; USPAT; USCOR; FPRS; EPO; ISM, TDS	OR	ON	2018/06/11 19:08
S28	8	S27 AND (occupant NEARS detect\$3) SAME (computer desktop) WITH use;	US- PGFUE; USPAT; USCOR; FPRS; EPO; ISM, TDS	OR	ON	2018/06/11 19:07
S29	7	S27 AND (occupant NEARS detect\$3) SAME (CUBICLE)	US- PGFUE; USPAT; USCOR; FPRS; EPO; ISM, TDS	OR	ON	2018/06/11 19:10
S30	8	smart ADJ building ADJ energy ADJ management	US- PGFUE; USPAT; USCOR; FPRS; EPO; ISM, TDS	OR	ON	2018/06/11 19:17
S31	1	(12/041472) APP	USPAT; USCOR	OR	ON	2018/06/11 19:39
S32	181	("20030215837" "20040225648") "20050234596" "20050275525" "20060026972" "20060111816" "5097672" "8067477" "6604023" "6756996" "6762319" "6832120" "6912429" "7055759" "7130719" "7187986" "7343226" "7436292" "7440699" "7480534" "7529646").PN. OR ("7604209") URPN	US- PGFUE; USPAT; USCOR	OR	ON	2018/06/11 19:39
S33	154	S32 AND (computer)	US- PGFUE; USPAT; USCOR	OR	ON	2018/06/11 19:43
S34	145	S32 AND (computer) AND user	US- PGFUE; USPAT; USCOR	OR	ON	2018/06/11 19:43
S35	75	S32 AND (computer) NEAR10 use:	US- PGFUE; USPAT; USCOR	OR	ON	2018/06/11 19:43
S36	815045	(video SAME computer)	US- PGFUE; USPAT; USCOR	OR	ON	2018/12/20 13:58

			FPRS; EPO; IBM TDB			
S37	22410	S36 AND (video SAME computer) AND (monitor SAME temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 13:59
S38	14573	S36 AND (video SAME computer) AND (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S39	684	S36 AND (video SAME computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S40	653	S36 AND (video WITH computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S41	18	S36 AND (video WITH computer) SAME (monitor WITH temperature) SAME (user ADJ interface)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:01
S42	277	(monitor WITH temperature) SAME (user ADJ interface) AND (HVAC)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:05
S43	35	(monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:06
S44	0	((monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC) AND (probability AND adult AND user AND content AND video))	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:06
S45	0	(12/181258) APP	USPAT; USOCR	OR	ON	2018/12/20 14:53

B.033

S45	1	(112/041472).APP.	USPAT; USCOR	OR	ON	2018/12/20 14:55
S47	65545	1005D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).eps.	US- PGPUB; USPAT; USCOR; FPMS; EPO; IBM, TDB	OR	ON	2018/12/20 14:56
S52	2	("15002791" "13470074" "12502064")	USPAT	OR	ON	2019/05/01 12:26
S53	1	("10289131")	USPAT	OR	ON	2019/05/01 12:27
S54	0	("10289131").PN.	USPAT	OR	ON	2019/05/01 12:27
S55	55	("6574537" "6619555" "6622926" "6633823" "6643587" "20090125151" "20060045105" "20090052859" "20100156608" "7242988" "4136732" "5270952" "0314004" "7884943" "5572438" "5717508" "6598056" "5977964" "7260823" "5555927" "20100289643" "7555225" "7802818" "20100162285" "5482225" "20110031323" "20070045431" "20100019051" "4453644" "6400996" "6595430" "6622925" "20090099999" "20070146128" "5682948" "20090099699" "20090281667" "5361461" "7354005" "6351693" "6480803" "6628997" "20080281472" "4655279" "5818347" "20100070089" "20100070093" "20100211224" "20100235004" "20080283621" "4674027" "5145751" "6437692" "7483964" "N002176" "5544036" "7055753" "7848900" "6549130" "6594625" "6622097" "7844860" "20090240381" "20100070086" "7356384" "5761083" "6178362" "6536675" "6542078" "6671545" "5912425" "7061393" "20090125151" "4341345" "5244146" "6200765" "20100019052" "7784704").PN.	USPAT	OR	ON	2019/05/01 16:22
S56	0	("20110290893").PN.	USPAT	OR	ON	2019/05/01 18:19
S57	1	("20110290893").PN.	US- PGPUB; USPAT	OR	ON	2019/05/01 18:19
S58	159	((("STEINBERG") near3 ("John")) INV.	US- PGPUB; USPAT; USCOR	OR	ON	2019/05/01 18:50
S59	87	555 AND (@pd<"20110401")	US- PGPUB; USPAT; USCOR	OR	ON	2019/05/01 18:50
S60	63	((("Steinberg") near3 ("John") near3 ("Douglas")) INV.	US- PGPUB;	OR	ON	2019/05/01 18:50

				USPAT: USCOR			
561	1	(12/788248) APP		USPAT: USCOR	OR	ON	2019/05/01 18:59
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S63	135	S62 AND (wireless)	US- PGPUB; USPAT; USOCR	OR	ON	2019/05/01 19:00
S64	122	S62 AND (wireless AND (thermostat sensor))	US- PGPUB; USPAT; USOCR	OR	ON	2019/05/01 19:00
S65	39	S62 AND (wireless AND (thermostat sensor)) AND (occupied)	US- PGPUB; USPAT; USOCR	OR	ON	2019/05/01 19:01
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S67	0	(15/816719) APP.	USPAT:	OR	ON	2019/05/01
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S69	20	US-20070290521-\$ or US- 20100318227-\$ or US-20100308119-\$ or US-20100282857-\$ or US-2010070234- \$ or US-20100280667-\$ or US- 2010070084-\$ or US-20060045105-\$ or US-20100289543-\$ or US-20090052359- \$ or US-20090271913-\$ or US- 20090065556-\$ or US-20130144453-\$ or US-20090099699-\$ or US-20100262259- \$). did. or (US-9244470-\$ or US- 6891836-\$ or US-6622925-\$ or US- 6594825-\$ or US-6530675-\$). did.	US- POPUS USPAT	OR	ON	2019/05/02 09:09
S70	1	(12/041472). APP.	USPAT; USOCR	OR	ON	2019/05/02 09:11
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S73	17	505 AND (memory AND processor\$1)	US- PGFUE; USPAT; USOCR	OR	ON	2019/05/02 09:56
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S75	99	("EcoFactor") .AS.AANM.	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM, TDB	OR	ON	2019/07/09 17:22
S76	21	S74 NOT S75	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM, TDB	OR	ON	2019/07/09 17:22
S77	1	(12/176952) APP	USPAT; USOCR	OR	ON	2019/07/10 08:54
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S81	13	S79 AND (sensor\$1 AND IEEE) NOT 860	US- PGPUB; USPAT; USOCR	OR	ON	2019/07/10 08:56
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B.041

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S88	3	S86 AND (sensor\$I AND (EEE AND (outdoor external) ADJ3 temperature)) NOT S87	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 12:32
S89	971	(sensor\$I AND "IEEE 802.11" AND (outdoor external) ADJ3 temperature)) NOT S87	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 12:36
S89	15	(sensor\$I AND "IEEE 802.11" SAME (outdoor external) ADJ3 temperature)) NOT S87	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 12:47
S95	99	("EcoFacier").AS.AANM.	US- PGFUE; USPAT; USOCR; FPRS; EPO; ISM_TDB	OR	ON	2019/07/10 12:51
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S101	229	S100 AND (home ADJ3 automation) AND (sensor\$I AND "IEEE 802.11" AND (outdoor external) ADJ3 temperature)) NOT S95	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 12:53
S102	117	S87 AND (home ADJ3 automation) AND (sensor\$I AND "IEEE 802.11" AND (outdoor external) ADJ3 temperature))	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 14:30
S103	0	(15/288054).APP.	USPAT; USOCR	OR	ON	2019/07/10 14:36
S104	1	(12/840059).APP.	USPAT; USOCR	OR	ON	2019/07/10 14:37
S105	75	("20070037605" "20070043478" "20070060171" "20070155401" "20070285510" "20070287473" "20080262820" "20090012704" "20090063122" "20090076749" "20090083167" "20090167529")	US- PGFUE; USPAT; USOCR	OR	ON	2019/07/10 14:38

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S109	18	S108 AND ((outdoor external) WITH temperature)	US- PGFUE; USPAT; USOCR	OR	CN	2019/07/10 15:14
S110	380	S87 AND (processor microprocessor) AND (sensor\$1 AND "IEEE 802.11" AND ((outdoor external) ADJ3 temperature))	US- PGFUE; USPAT; USOCR	OR	CN	2019/07/10 16:16
S111	0	S110 AND (@pd<"20070701")	US- PGFUE; USPAT; USOCR	OR	CN	2019/07/10 16:20
S112	6	S87 AND (processor microprocessor) AND (sensor\$1 AND "802.11" AND ((outdoor external) ADJ3 temperature)) AND (@pd<"20070701")	US- PGFUE; USPAT; USOCR	OR	CN	2019/07/10 16:21

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	12609	G05D23/00; G08G1/03; F24F11/006; F24F11/70; F24F11/82; F24F11/30; G08G15/02; G08N7/005; G05D23/1902;	USPAT	OR	CN	2019/08/20 18:09

B.044

		F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.				
L6	0	((monitor WITH temperature) SAME (user ACU interface SAME (computer laptop)) AND (HVAC) AND (probability AND active AND user AND content AND video)).CLM.	USPAT	OR	ON	2019/08/20 16:09
L7	0	L6 AND 5	USPAT	OR	ON	2019/08/20 16:09
S45	0	((monitor WITH temperature) SAME (user ACU interface SAME (computer laptop)) AND (HVAC) AND (probability AND active AND user AND content AND video)).CLM.	USPAT	OR	ON	2018/12/20 14:35
S60	10098	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	USPAT	OR	ON	2018/12/20 14:38
S61	10163	(G05D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	USPAT	OR	ON	2018/12/20 14:55

8/20/2019 6:27:01 PM

C:\Users\aojha\Documents\EAST Workspaces\16374085.wsp

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
	Examiner	Ojha, Ajay
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	2019/0186771	06/20/2019	Steinberg et al.	
	2	2019/0187005	06/20/2019	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

31064785

Examiner Signature /AJAY OJHA/	Date Considered 08/20/2019
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.046



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY DOCKET NO./TITLE	REQUEST ID
16/374,085	04/03/2019	EcoFactor, Inc.	EFAC1.011C3	92945

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 08/02/2019 has been accepted.

CERTIFICATIONS:**Change of Entity Status:**

☒ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/John R. King/
Name:	John R. King
Registration Number:	34362

EFACT.011C3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Filed	: April 03, 2019
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ojha, Ajay
Art Unit	: 2824
Conf. No.	: 6894

RESPONSE TO OFFICE ACTION DATED JULY 17, 2019

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Office Action dated July 17, 2019, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

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Filing Date: April 03, 2019

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;

the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building, wherein the second data from the network connection is received via the Internet;

the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

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the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface on a mobile, wireless device running software application code ~~website-accessible through via~~ the Internet;

the one or more processors with circuitry and code designed to execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature;

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;

the first processor with circuitry and code designed to execute instructions to communicate with the memory;

wherein the memory is configured to store historical values of the first data and second data.

2. (Previously Presented) The system of claim 1, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.

3. (Previously Presented) The system of claim 1, wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.

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4. (Original) The system of claim 2, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

5. (Original) The system of claim 4, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

6. (Previously Presented) The system of claim 4, wherein the one or more processors with circuitry and code designed to execute instructions queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

7. (Previously Presented) The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions receives at least one setting of the HVAC system.

8. (Original) The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.

9. (Original) The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.

10. (Original) The system of claim 4, wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.

11. (Original) The system of claim 1, wherein the network connection is based on the IEEE 802.11 wireless protocol.

12. (Canceled)

13. (Canceled)

14. (Original) The system of claim 1, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

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15. (Original) The system of claim 1, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

16. (Currently Amended) The system of claim 1, ~~wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and not in electrical contact with the memory, and~~ wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

17. (Original) The system of claim 7, wherein the interface is configured to allow the user to turn the HVAC system on or off.

18. (Original) The system of claim 7, wherein the interface is configured to allow the user to input that the building is currently unoccupied.

19. (Currently Amended) A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

the one or more processors with circuitry and code designed to execute instructions to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;

the one or more processors with circuitry and code designed to execute instructions to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature, wherein the second data from the network connection is received via the Internet;

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the one or more processors with circuitry and code designed to execute instructions to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

the one or more processors with circuitry and code designed to execute instructions to receive commands through the Internet by way of a remote interface on a mobile, wireless device running software application code; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

the one or more processors with circuitry and code designed to execute instructions to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is configured to be presented on a user interface via on mobile, wireless device running software application code ~~website-accessible through~~ via the Internet;

the one or more processors with circuitry and code designed to execute instructions to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;

the one or more processors with circuitry and code designed to execute instructions to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied;

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions, which is located remotely from the memory and is not electrically connected to the memory;

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the first processor with circuitry and code designed to execute instructions to communicate with the memory;

wherein the memory is configured to store historical values of the first data and second data.

20. (Currently Amended) The system of claim 19, ~~wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and not in electrical contact with the memory, and~~ wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

21. (New) The system of claim 1, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

22. (New) The system of claim 19, wherein the one or more processors with circuitry and code designed to execute instructions controls the HVAC system to provide heating or cooling to the building at an operational temperature based at least in part on the historical values of the first and second data.

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REMARKS

The July 17, 2019 Office Action was based upon pending Claims 1-20. This Amendment amends Claims 1, 16, 19, and 20, cancels Claims 12 and 13, and adds new Claims 21 and 22. Thus, after entry of this Amendment, Claims 1-22 are pending and presented for further consideration.

REJECTION OF CLAIMS 13, 16, and 20 UNDER 35 U.S.C. § 112

Claims 13, 16, and 20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully disagrees that the phrase “not in electrical contact with the memory” renders the claims indefinite and respectfully disagrees with Examiner’s characterization of this phrase in the Office Action, even under the broadest reasonable interpretation standard.

However, in the interest of advancing prosecution, Applicant has canceled Claim 13 and amended Claims 1, 16, 19, and 20 to provide further clarity. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

REJECTION OF CLAIMS 1-20 ARE REJECTED UNDER 35 U.S.C. § 103(a)

Claims 1-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny (hereinafter “Podgorny”) in view of U.S. Publication No. 2005/0270151 to Winick (hereinafter “Winick”).

Applicant respectfully disagrees with the Examiner’s characterization of the prior art of record and does not admit to any characterization or limitation of the claims or to any characterization of a reference by the Examiner, particularly any that are inconsistent with the language of the claims considered in their entirety and including all of their constituent limitations.

In the interest of advancing prosecution, Applicant has amended Claims 1, 16, 19, and 20, and added new Claims 21 and 22, to recite additional limitations and to provide further clarity to the claims. Applicant respectfully submits that the prior art of

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record, alone or in combination, do not disclose all of the limitations of independent Claims 1 and 19. Applicant submits that the dependent claims are also allowable at least because they depend from an allowable independent claim.

To avoid burdening the record and in view of the allowability of independent Claims 1 and 19 as discussed above, Applicant reserves the right to discuss the further patentable features of the dependent claims in a future submission, if appropriate. Moreover, Applicant does not admit that the Podgorny-Winick combination proposed in the Office Action is possible or that the Office Action has provided an adequate reason for combining Podgorny and Winick in the manner proposed, but reserves the right to challenge the propriety and reasons for combining in a future submission, if appropriate.

Accordingly, Applicant submits that Claims 1 and 19, and their dependent claims, are in condition for allowance.

REQUEST FOR EVIDENTIARY SUPPORT

Should a rejection based on any of the above asserted rejections be maintained, Applicant respectfully requests appropriate evidentiary support. Additionally, if the Examiner is relying upon "common knowledge," "well known" principles, "Official Notice," or other information within the Examiner's personal knowledge to establish the rejection, Applicant requests that a reference be provided in support of this position or that an affidavit be provided pursuant to M.P.E.P. § 2144.03 and 37 C.F.R. § 1.104(d)(2).

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by the present application's assignee:

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/994,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg	12/502,064 Now Pat. 8,180,492	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Now Pat. 8,498,753	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Now Pat. 8,740,100	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Now Pat. 8,596,550	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Now Pat. 8,556,188	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	12/959,225 Now Pat. 8,131,497	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Now Pat. 8,131,506	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	13/219,381 Now Pat. 9,134,710	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Now Pat. 8,423,322	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	13/329,117 Now Pat. 8,340,826	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/409,697 Now Pat. 8,412,488	03/01/12	EFACT.004C2	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/409,729 Now Pat. 8,886,488	03/01/12	EFACT.005C2	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	13/470,074 Now Pat. 9,244,470	05/11/12	EFACT.011C1	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Hublou et al.	13/523,697 Now Pat. 10,048,706	06/14/12	EFACT.014A	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	13/725,447 Now Pat. 8,712,590	12/21/12	EFACT.013C2	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/852,577 Now Pat. 8,738,327	03/28/13	EFACT.004C3	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/858,710 Now Pat. 8,751,186	04/08/13	EFACT.005C3	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/861,189 Now Pat. 9,057,649	04/11/13	EFACT.006C2	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	13/952,253 Published As 2013/0310989 Now Abandoned	07/26/13	EFACT.009C1	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	14/048,932 Now Pat. 8,840,033	10/08/13	EFACT.012C1	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/082,675 Now Pat. 9,194,597	11/18/13	EFACT.007C1	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/263,762 Now Pat. 9,188,994	04/28/14	EFACT.013C3	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	14/285,384 Published As 2015/0043615 Now Abandoned	05/22/14	EFACT.004C4	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	14/292,377 Now Pat. 9,279,594	05/30/14	EFACT.008C1	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg	14/491,554 Now Pat. 9,709,292	09/19/14	EFACT.012C2	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/527,433 Published As 2015/0120235 Now Abandoned	10/29/14	EFACT.005C4	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	14/731,221 Now Pat. 9,939,333	06/04/15	EFACT.006C3	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Cheung et al.	14/842,134 Now Pat. 10,254,775	09/01/15	EFACT.010C2	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	14/878,872 Now Pat. 10,018,371	10/08/15	EFACT.007C2	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/920,063 Published As 2016/0097557 Now Abandoned	10/22/15	EFACT.013C4	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg	15/002,791 Now Pat. 10,289,131	01/21/16	EFACT.011C2	System And Method For Using A Wireless Device As A Sensor For An Energy Management System

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	15/047,352 Now Pat. 9,982,905	02/18/16	EFACT.008C2	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/060,226 Published As 2016/0258822 Now Abandoned	03/03/16	EFACT.005C5	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	15/097,078 Published As 2016/0363337 Now Abandoned	04/12/16	EFACT.009C2	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	15/426,882 Published As 2017/0241662 Now Abandoned	02/07/17	EFACT.005C6	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	15/616,719 Published As 2017/0336090 Now Abandoned	06/07/17	EFACT.012C3	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Okita et al.	15/707,686 Published As 2019/0086882 Now Abandoned	09/18/17	EFACT.018A2	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,735 Published As 2019/0089194	09/18/17	EFACT.018A1	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,753 Published As 2019/0086109 Now Abandoned	09/18/17	EFACT.018A3	Occupancy Determination Using Energy Consumption Indications
Okita et al.	15/707,769 Published As 2019/0086110 Now Abandoned	09/18/17	EFACT.019A2	Systems And Methods For Acclimatization-Based Variable Thermostat Settings

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Okita et al.	15/707,829 Published As 2019/0086108 Now Abandoned	09/18/17	EFACT.019A1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Okita et al.	15/707,873 Published As 2019/0086106 Now Abandoned	09/18/17	EFACT.019A3	Systems And Methods For Fan Delay-Based Variable Thermostat Settings
Okita et al.	15/713,318 Published As 2018/0087795	09/22/17	EFACT.017A2	Multi-Function Thermostat
Okita et al.	15/713,358 Published As 2018/0087793	09/22/17	EFACT.017A1	Multi-Function Thermostat
Steinberg et al.	15/836,688 Published As 2018/0259400 Now Abandoned	12/08/17	EFACT.004C5	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	15/841,039 Published As 2018/0216841	12/13/17	EFACT.013C5	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	15/905,251 Published As 2018/0321093	02/26/18	EFACT.006D1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	15/965,339 Published As 2018/0313567	04/27/18	EFACT.008C3	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/994,532 Now Abandoned	05/31/18	EFACT.004C6	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	16/028,230 Published As 2019/0137133	07/05/18	EFACT.007C3	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Hublou et al.	16/033,565 Now Abandoned	07/12/18	EFACT.014C1	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Steinberg et al.	16/193,478	11/16/18	EFACT.007C4	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg et al.	16/193,530 Published As 2019/0187005	11/16/18	EFACT.004C7	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	16/264,050	01/31/19	EFACT.012C4	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	16/277,682	02/15/19	EFACT.005C7	System And Method For Calculating The Thermal Mass Of A Building
Hublou et al.	16/287,366	02/27/19	EFACT.014C2	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Okita et al.	16/290,111	03/01/19	EFACT.019A1C1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Steinberg et al.	16/290,226	03/01/19	EFACT.009C3	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	16/295,272	03/07/19	EFACT.004C8	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	16/295,402	03/07/19	EFACT.010C3	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	16/295,436	03/07/19	EFACT.007C5	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg et al.	16/374,083	04/03/19	EFACT.006C4	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	16/374,085	04/03/19	EFACT.011C3	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Steinberg	16/374,246	04/03/19	EFACT.012C5	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	16/523,806	07/26/19	EFACT.013C6	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters

Application No.: 16/374,085
Filing Date: April 03, 2019

including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing references for consideration. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Application No.: 16/374,085
Filing Date: April 03, 2019

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 08/02/2019

By: /John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

31064652

Electronic Patent Application Fee Transmittal

Application Number:	16374085			
Filing Date:	03-Apr-2019			
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C3			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
Total in USD (\$)				240

Electronic Acknowledgement Receipt

EFS ID:	36769821
Application Number:	16374085
International Application Number:	
Confirmation Number:	6894
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/ThuyQuyen Nguyen
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C3
Receipt Date:	02-AUG-2019
Filing Date:	03-APR-2019
Time Stamp:	19:22:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$240
RAM confirmation Number	E201982J23361157
Deposit Account	111410
Authorized User	ThuyQuyen Nguyen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

B.070

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C3_ids.pdf	34623	yes	3
			7d2ca4226aa508c0baac07c41c65362896119256c		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Notification of loss of entitlement to small entity status	EFACT-011C3_submission.pdf	19464	no	2
			cc2c06ffac10c538a76c810d61889d1c5c1f534c4		
Warnings:					
Information:					
3		EFACT-011C3_response.pdf	85268	yes	20
			430eac092c51a21a33c4697a80a4c8370c48a71c9		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	7	
	Applicant Arguments/Remarks Made in an Amendment		8	20	
Warnings:					
Information:					

4	Fee Worksheet (SB06)	fee-info.pdf	30875 6a2dd6810e310f3f0f3c0e602e97ac54e91e9d	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	170230
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT

First Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Filed	: April 3, 2019
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ojha, Ajay
Art Unit	: 2824
Conf. No.	: 6894

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after receipt of a First Office Action, but before the mailing date of a Final Action and before the mailing date of a Notice of Allowance.

Application No.: 16/374,085
Filing Date: April 3, 2019

This Statement is accompanied by the fees set forth in 37 CFR 1.17(p). The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: August 2, 2019

By: John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

31064860

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	16/374085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	2019/0186771	06/20/2019	Steinberg et al.	
	2	2019/0187005	06/20/2019	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

31064785

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.075

EFACT.011C3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Title	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Filed	: April 3, 2019
Art Unit	: 2824
Conf. No.	: 6894

SUBMISSION TO PAY DEFICIENCY OWED UNDER 37 C.F.R. § 1.28(c)(2)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Various fees in the above-referenced application were paid as a small entity in good faith, but it has been later discovered that such status as a small entity was in error. The following is a calculation and itemization of the deficiency payment required by 37 C.F.R. § 1.28(c)(2).

Type of Fee	Date Previously Paid	Amount Previously Paid (\$)	Current Fee Amount (\$)	Deficiency Owed Amount (\$)
Basic Filing Fee	April 3, 2019	\$75.00	\$300.00	\$225.00
Search Fee	April 3, 2019	\$330.00	\$660.00	\$330.00
Examination Fee	April 3, 2019	\$380.00	\$760.00	\$380.00
Request for Prioritized Examination	April 3, 2019	\$2,000.00	\$4,000.00	\$2,000.00
Processing Fee	April 3, 2019	\$70.00	\$140.00	\$70.00
Total Deficiency Payment Owed (\$)				\$3,005.00

Application No.: 16/374,083
Filing Date: April 3, 2019

This deficiency payment constitutes notification of loss of entitlement to small entity status under 37 C.F.R. § 1.27(g)(2), in accordance with 37 C.F.R. § 1.28(d).

Please charge the deficiency amount of \$3,435.00 and any other fees that may be due or credit any overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: August 1, 2019

By: /John R. King/
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

31064904

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Serial Number		Filing Date	
Substitute for Form PTO 876				62/374,085		04/01/2019	
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO							
APPLICATION AS FILED - PART I							
FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE (\$)		FEE (\$)	
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
TOTAL CLAIMS (37 CFR 1.16(a))	more 20 = *			x \$100 =			
INDEPENDENT CLAIMS (37 CFR 1.16(a))	more 5 = *			x \$480 =			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(c))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(B) and 37 CFR 1.15(c).						
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT* (37 CFR 1.16(d))							
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL			
APPLICATION AS AMENDED - PART II							
AMENDMENT	08/02/2019	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(a))	* 20	Amend ** 20	= 0	x \$100 =	0	
	Independent (37 CFR 1.16(a))	* 2	Amend *** 5	= 0	x \$480 =	0	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))						
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
					TOTAL ADDL FEE		0
AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(a))	*	Amend **	=	x \$0 =		
	Independent (37 CFR 1.16(a))	*	Amend ***	=	x \$0 =		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))						
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
					TOTAL ADDL FEE		
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.					LIE		
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20"					ANGELA S WHITE/		
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 5, enter "5"							
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.							

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to be (and by the USPTO to) process an application. Confidentiality is guaranteed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 10 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22304-1450. DO NOT SEND FILED OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/374,085	04/03/2019	John Douglas Steinberg	EPACT.011C3

CONFIRMATION NO. 6894

PUBLICATION NOTICE



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 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
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 IRVINE, CA 92614

Title: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Publication No. US-2019-0227582-A1

Publication Date: 07/25/2019

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EFACT.011C3	6894
20995	7590	07/17/2019	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			OJHA, AJAY	
2040 MAIN STREET			ART UNIT	PAPER NUMBER
FOURTEENTH FLOOR				
IRVINE, CA 92614			2824	
			NOTIFICATION DATE	DELIVERY MODE
			07/17/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com

jayna.cartee@knobbe.com

Office Action SummaryApplication No.
15/374,085Applicant(s)
Steinberg, John DouglasExaminer
AJAY CHAArt Unit
2824AIA (FITF) Status
No**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.135(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.

Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (28 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may require any earned patent term adjustment. See 37 CFR 1.704(g).

Status1) ☒ Responsive to communication(s) filed on Amendment/Req. Reconsider - After Non-Final Reject - 06/12/2019.☐ A declaration(s)/affidavit(s) under 37 CFR 1.135(b) was/were filed on _____.2a) ☐ This action is FINAL.2b) ☒ This action is non-final.3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.**Disposition of Claims***5) ☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.7) ☒ Claim(s) 1-20 is/are rejected.8) ☐ Claim(s) _____ is/are objected to.9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.**Application Papers**10) ☐ The specification is objected to by the Examiner.11) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 11912) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).**Certified copies:**a) ☒ All b) ☐ Some** c) ☐ None of the:1) ☒ Certified copies of the priority documents have been received.2) ☐ Certified copies of the priority documents have been received in Application No. _____.3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)1) ☒ Notice of References Cited (PTO-892)3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date _____

2) ☒ Information Disclosure Statement(s) (PTO/83-58a and/or PTO/55-18b)4) ☐ Other: _____

Paper No(s)/Mail Date _____

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DETAILED ACTION

General Remarks

1. The present application is being examined under the **pre-AIA** first to invent provisions.
2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.
3. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
4. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
5. Applicants seeking an interview with the examiner, including **WebEx Video Conferencing**, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
6. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 19.
 - b. Pending: 1-20.

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IDS

7. Applicant's IDS(s) submitted on 06/11/2019 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has/have considered by the examiner and made of record.

Priority

8. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, 365(c), or 386(c) is acknowledged.

Double Patenting

9. Double Patenting rejection has been withdrawn in view of Terminal Disclaimer approved on 06/12/2019.

Claim Rejections - 35 USC § 112

10. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. **Claims 13, 16 and 20 rejected under 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or the applicant regards as the invention.**

Re: Claims 13, 16 and 20, the phrase "*not in electrical contact with the memory*" renders the claim indefinite because it is unclear whether the limitation(s) means no ability to electrically communicate with the memory or if the memory is not monolithically part of the processor.

For the purpose of compact prosecution the limitation in view of the specification (Fig. 4) will be interpreted --*the memory is not part of the processor*--.

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Claim Rejections - 35 USC § 103

12. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claim(s) 1-20 is/are rejected under AIA 35 U.S.C. 103 as being unpatentable over US 20080281472 (hereinafter "Podgorny") in view of US 20050270151 A1 (hereinafter "Winick").**

Re: Independent Claim 1 (Currently amended), Podgorny discloses a system for controlling an HVAC system at a user's building (Podgorny Figs. 1-22), the system comprising:

the one or more processors with circuitry and code designed to execute instructions configured to receive a first data from at least one sensor (Podgorny Fig. 22: Built-in Humidity and Temp. Sensor interfaced to microcontroller or processor as set forth below), wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building (Podgorny ¶ [0070], [0097], [0099], [0148] disclosed reading values from various sensors);

the one or more processors with circuitry and code designed to execute instructions further configured to receive a second data from a network connection,

the one or more processors with circuitry and code designed to execute instructions further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0091]-[0092] and [0019] "user preferences stored" in "occupied/non-occupied"), and

a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

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the one or more processors with circuitry and code designed to execute instructions further configured to receive commands through the Internet by way of a remote interface (Podgorny Fig. 21 and at least ¶¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices" and [0142] "The System provides a graphical User Interface 2100...");

wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system (Podgorny ¶¶ [0019], [0089]-[0092] "occupancy sensor shuts the system down when users are away from their workstations" disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors with circuitry and code designed to execute instructions further configured to send user-specific data through the Internet (Podgorny ¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices."),

wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data (Podgorny ¶ [0021] "The system is able to customize environmental properties of the building spaces to align them with the preferences declared by the individual users....maintain the environmental parameters temperature"; see also ¶¶ [0008], [0029]-[0030] and [0063]),

wherein the user-specific information is presented on a website accessible through the Internet (Podgorny Fig. 21 and at least ¶¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices" and [0142] "The System provides a graphical User Interface 2100...");

the one or more processors with circuitry and code designed to execute instructions further configured to determine whether the building is occupied or unoccupied, and based on that

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determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Podgorny is silent regarding:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

wherein the second data from the network connection is collected from a source external to the building;

Winick discloses:

a memory (Winick Fig. 1: Memory 106); and

one or more processors with circuitry and code designed to execute instructions (Winick Fig. 1:

Processor 104);

wherein the second data from the network connection is collected from a source external to the building (Winick Figs. 2, 7 and ¶¶ [0038]-[0040], [0076]: outdoor temperature sensors 240 and 42 to provide external temperature data);

Podgorny and Winick disclose home automation and HVAC control system. Winick discloses explicit implementation of HVAC control system based on in part on a microprocessor, memory, communication module, display, keyboard, external/remote devices etc. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny for using generic computing components such as generic microprocessor and memories for flexible programming and control of the HVAC system including over the internet for environmental control of a dwelling including external temperature

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monitoring and remote device control including carbon monoxide monitoring devices (Winick ¶¶ [0040]-[0041]).

Re: Claim 2 (Currently amended), Podgorny and Winick discloses all the limitations of claim 1 on which this claim depends. They further disclose:

wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied (Podgorny ¶¶ [0019], [0089]-[0092] "...occupancy sensor shuts the system down when users are away from their workstations").

Re: Claim 3 (Currently amended), Podgorny and Winick discloses all the limitations of claim 1 on which this claim depends. They further disclose:

wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied (Podgorny ¶¶ [0019], [0089]-[0092] "...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...").

Re: Claim 4 (Original), Podgorny and Winick discloses all the limitations of claim 2 on which this claim depends. They further disclose:

wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor (Podgorny ¶ [0097] discloses "...Read temperature...", ¶

[0104] provides an example of reading a temperature "...reading from the device thermometer01 was 75 degrees...").

Re: Claim 5 (Original), Podgorny and Winick discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the second data from the network connection comprises a measurement of the current outdoor temperature (Winick Figs. 2, 7 and ¶¶ [0038]-[0040], [0076]: outdoor temperature sensors 240 and 42 to provide external temperature data).

Re: Claim 6 (Currently amended), Podgorny and Winick discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the one or more processors with circuitry and code designed to execute instructions ~~is further configured to~~ queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied (Podgorny Table 1 "...establishes user presence in a zone based on a reading from a presence sensor", ¶ [0083] "...detects the presence of the user... notifies Smart Building Framework 100 about identity of the logged in user...", ¶ [0093] "...present invention offers certain niceties, such as biometrics identifying the person... full control of PEM control elements, as well as providing additional temperature and humidity..." and thus after identifying the user the system is capable of adjusting environment to user preferences).

Re: Claim 7 (Currently amended), Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors with circuitry and code designed to execute instructions ~~is further configured to~~ receives at least one setting of the HVAC system (Podgorny Fig. 14 and ¶¶ [0019], [0089]-[0092] “...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...”).

Re: Claim 8 (Original), Podgorny and Winick discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine current status of HVAC).

Re: Claim 9 (Original), Podgorny and Winick discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode (e.g. Podgorny ¶ [0104] “...Current status of active devices; and/or, heating module in device PEM01 is on.” So there is at least a heating mode).

Re: Claim 10 (Original), Podgorny and Winick discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor (e.g. Podgorny Table 3 discloses sensing of user presence using motion detector “...users are present... shall be determined by...sensor devices. An example of such sensor devices is a motion detector...”).

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Re: Claim 11 (Original), Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the network connection is based on the IEEE 802.11 wireless protocol (Winick ¶ [0012] “...HVAC system incorporates a wireless control system...(e.g., 802.11x, ...)...”).

Re: Claim 12 (Original), Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the memory is further configured to store historical values of the first data and second data (Podgorny ¶ [0078] “DBMS 80...System state history...”; see also Table 3).

Re: Claim 13 (Currently amended), as best as can be understood Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and *the memory is not part of the processor* (Winick Fig. 1: Memory 106 is separate from the processor 104).

Re: Claim 14 (Original), Podgorny and Winick all the limitations of claim 13 on which this claim depends. They further disclose:

wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor (Podgorny ¶¶ [0019], [0089]-[0092] “...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...”).

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Re: Claim 15 (Original), Podgorny and Winick discloses all the limitations of claim 13 on which this claim depends. They further disclose:

wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Re: Claim 16 (Currently amended), as best as can be understood Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors with circuitry and code designed to execute instructions comprises a first processor that is located remotely from the memory and *the memory is not part of the processor*, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor (Winick Fig. 2: Memory 106 is separate from the processor 104 and wireless remote device 130).

Re: Claim 17 (Original), Podgorny and Winick discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the interface is configured to allow the user to turn the HVAC system on or off (Podgorny ¶ [0021] “...Manual administrative control: The system provides means for an authorized personnel administrator to monitor the status of the system and set the global, overriding goals for the system...”; Fig. 21 shows a user GUI that can be used to turn HVAC on/off by manipulating temp./humidity settings, when applied the system may turn on/off to meet the updated environmental conditions).

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Re: Claim 18 (Original), Podgorny and Winick discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the interface is configured to allow the user to input that the building is currently unoccupied (Podgorny ¶ [0099] discloses occupancy state can be set to occupied or unoccupied using "...EO set occupancy state...").

Re: Independent Claim 19 (Currently amended), Podgorny discloses a system for controlling an HVAC system at a user's building (Podgorny Figs. 1-22), the system comprising:

the one or more processors with circuitry and code designed to execute instructions configured to receive a first data from at least one sensor (Podgorny Fig. 22: Built-in Humidity and Temp. Sensor interfaced to microcontroller or processor as set forth below), wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor (Podgorny ¶ [0070], [0097], [0099], [0148] disclosed reading values from various sensors);

the one or more processors with circuitry and code designed to execute instructions further configured to receive a second data from a network connection,

the one or more processors with circuitry and code designed to execute instructions further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0091]-[0092] and [0019] "user preferences stored" in "occupied/non-occupied"), and

a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

the one or more processors with circuitry and code designed to execute instructions further configured to receive commands through the Internet by way of a remote interface (Podgorny Fig. 21 and at least ¶¶ [0024] “...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices” and [0142] “The System provides a graphical User Interface 2100...”);

wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors with circuitry and code designed to execute instructions further configured to send user-specific data through the Internet (Podgorny ¶ [0024] “...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices.”),

wherein user-specific information about the building and HVAC system is generated based at least in part on the *user-specific data* (Podgorny ¶ [0021] “The system is able to customize environmental properties of the building spaces to align them with the preferences declared by the individual users....maintain the environmental parameters temperature”; see also ¶¶ [0008], [0029]-[0030] and [0063]),

wherein the user-specific information is presented on a website accessible through the Internet (Podgorny Fig. 21 and at least ¶¶ [0024] “...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices” and [0142] “The System provides a graphical User Interface 2100...”);

the one or more processors with circuitry and code designed to execute instructions further configured to receive a third data from a motion sensor (Podgorny ¶ [0010] discloses use of motion

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sensor to adjust comfort level; therefore this limitation has been taught), and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Podgorny is silent regarding:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature;

Winick discloses:

a memory (Winick Fig. 1: Memory 106); and

one or more processors with circuitry and code designed to execute instructions (Winick Fig. 1: Processor 104);

wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature (Winick Figs. 2, 7 and ¶¶ [0038]-[0040], [0076]: outdoor temperature sensors 240 and 42 to provide external temperature data);

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Podgorny and Winick disclose home automation and HVAC control system. Winick discloses explicit implementation of HVAC control system based on in part on a microprocessor, memory, communication module, display, keyboard, external/remote devices etc. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny for using generic computing components such as generic microprocessor and memories for flexible programming and control of the HVAC system including over the internet for environmental control of a dwelling including external temperature monitoring and remote device control including carbon monoxide monitoring devices (Winick ¶¶ [0040]-[0041]).

Re: Claim 20 (Currently amended), as best as can be understood Podgorny and Winick discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors comprises a first processor that is located remotely from the memory and *the memory is not part of the processor*, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor (Winick Fig. 2: Memory 106 is separate from the processor 104 and wireless remote device 130).

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Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is (571)272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <https://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/
Primary Examiner, Art Unit 2824
ajay.ojha@uspto.gov

rte 7/11/19

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Notice of References CitedApplication/Control No.
16/374,085Applicant(s)/Patent Under
Reexamination
Steinberg, John DouglasExaminer
AJAY OJHAArt Unit
2824

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20050270151-A1	12-2005	Winick, Steven J.	G08B17/00	340/539.1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS


*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)

Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	05/03/2019	AO
Refreshed search.	07/10/2019	AO

CPC Combination Sets - Searched*		
Symbol	Date	Examiner


US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search.	05/03/2019	AO
Refreshed search. See search history.	07/10/2019	AO
NF2	07/11/2019	rte

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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<p><i>Index of Claims</i></p> 	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/374,085	Steinberg, John Douglas
	Examiner	Art Unit
	AJAY DJHA	2824

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

[illegible]

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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B.100

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L15	3	L13 AND (sensor\$1 AND IEEE AND ({outdoor external} ADJ3 temperature)) NOT L14	US- PGFUB; USPAT; USOCR	OR	ON	2019/07/10 12:32
L16	371	(sensor\$1 AND "IEEE 802.11" AND ({outdoor external} ADJ3 temperature)) NOT L14	US- PGFUB; USPAT; USOCR	OR	ON	2019/07/10 12:36
L17	15	(sensor\$1 AND "IEEE 802.11" SAME ({outdoor external} ADJ3 temperature)) NOT L14	US- PGFUB; USPAT; USOCR	OR	ON	2019/07/10 12:47
L22	99	("EcoFactor").AS.AANM.	US- PGFUB; USPAT; USOCR; PPPS; EPO; IBM TDB	OR	ON	2019/07/10 12:51
L27	1301	(sensor\$1 AND "IEEE 802.11" AND ({outdoor external} ADJ3 temperature)) NOT L22	US- PGFUB; USPAT; USOCR	OR	ON	2019/07/10 12:52
L28	229	27 AND (home ADJ3 automation) AND (sensor\$1 AND "IEEE 802.11" AND ({outdoor external} ADJ3 temperature)) NOT L22	US- PGFUB; USPAT; USOCR	OR	ON	2019/07/10 12:53
L29	117	L14 AND (home ADJ3 automation) AND (sensor\$1 AND "IEEE 802.11" AND	US- PGFUB;	OR	ON	2019/07/10 14:30

B.101

		((outdoor external) ADJ3 temperature))	USPAT; USCCR			
L30	0	15/288654).APP.	USPAT; USCCR	OR	ON	2019/07/10 14:36
L31	1	12/840059).APP.	USPAT; USCCR	OR	ON	2019/07/10 14:37
L32	75	("20070037805" "20070043478" "20070060171" "20070155401" "20070285510" "20070287473" "20080262820" "20090012704" "20090063122" "20090076749" "20090083167" "20090157529" "20090187499" "20090185349" "20090240381" "20090302994" "20090319671" "20100099035" "20100088261" "20110004355" "20110246606" "8400955" "7185305" "7257397" "7343225" "7574208" "8128685" "8131401").PN. OR ("8509954").URPN.	US- PGPUB; USPAT; USCCR	OR	ON	2019/07/10 14:38
L33	1	13/353754).APP.	USPAT; USCCR	OR	ON	2019/07/10 15:04
L34	44	("20060065750" "20080315000" "20100070691" "20100082161" "20110153690" "20120016524" "20120290051" "20120324931" "20130099011" "20130274928" "20140166232" "5528349" "5684463" "5825550" "5924488" "6064310" "6167389" "6216956" "6374581" "6522925" "6755635" "6860431" "6936798" "7010363" "7079587" "7204093" "7296425" "7331187" "7364083" "7392661" "7752858" "7949515" "8008603" "8204628" "8528831").PN. OR ("9244445").URPN.	US- PGPUB; USPAT; USCCR	OR	ON	2019/07/10 15:04
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L36	18	L35 AND ((outdoor external) WITH temperature)	US- PGPUB; USPAT; USCCR	OR	ON	2019/07/10 15:14
L37	360	L14 AND (processor microprocessor) AND (sensor\$1 AND "IEEE 802.11" AND ((outdoor external) ADJ3 temperature))	US- PGPUB; USPAT; USCCR	OR	ON	2019/07/10 16:16
L38	0	37 AND (@pdc "20070701")	US- PGPUB; USPAT; USCCR	OR	ON	2019/07/10 16:20

L39	6	L14 AND (processor microprocessor) AND (sensor\$1 AND "802.11" AND ((outdoor external) AND temperature)) AND (@pc<"20070701")	US-PGFLB; USPAT; USOCR	OR	ON	2019/07/10 16:21
S1	149	("STEINBERG") near3 ("John").INV.	US-PGFLB; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	"EcoFactor").AS.AANM.	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 09:40
S3	46883	F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G06D23/1902; F24F11/66; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND user\$1 AND wireless).CLM	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:03
S6	15	("9244476")	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:11
S6	9	("9244476")	USPAT	OR	ON	2018/02/07 10:12
S7	25	("20040117330" "20090065596" "20150025691" "9706224" "20130173064" "20040133314" "5348074" "7669907" "8850348" "9057549" "20140316581" "20150120235" "7206670" "20130176985").PN	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:06
S8	4	("20090281472" "20090065596")	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:12
S10	32	US-20010025349-\$ US-20040117330-\$ US-20040133314-\$ US-20090065596-\$ US-20090065070-\$ US-20090062970-\$ US-20090057426-\$ US-20130073094-\$ US-20090271019-\$ US-20170241682-\$ US-20180087793-\$ US-1234567-\$ US-4270993-\$ US-4702305-\$ US-4702413-\$ US-5207830-\$	US-PGFLB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/08/11 10:27

		\$ US-5454511-\$ US-5706190-\$ US-5833654-\$ US-6216956-\$ US-6223544-\$ US-6449534-\$ US-6454177-\$ US-6845918-\$ US-6981383-\$ US-7983795-\$ US-9709292-\$ US-9939333-\$). D/D.				
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S12	9	"20160061474" "9244470" "9279894" "20060283965" "20080083234" "20090065596"). PN.	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:03
S13	3	WO-2009036764-\$). D/D	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:36
S14	0	(desktop ADU usage WITH control ADU3 temperature)	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:38
S15	18	(desktop ADU usage WITH control WITH environment)	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:43
S16	147	(desktop ADU usage)	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:49
S17	0	S16 AND (desktop ADU usage WITH air\$conditioning)	US-PGFUS: USPAT: USOCR: FPRS: EPO: IBM TDB	OR	ON	2018/06/11 18:50
S18	11	S16 AND (desktop ADU usage WITH	US-	OR	ON	2018/06/11

		environment\$2)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB			2018/06/11 18:51
S19	0	S18 AND (smart SAME room ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:55
S20	0	(smart SAME room ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:56
S21	0	(smart ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:58
S22	0	(wireless ADJ device ADJ aware WITH thermostat)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:56
S23	2024	(smart ADJ (thermostat))	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:00
S24	8	S23 AND (smart ADJ (thermostat) SAME (computer desktop TV) ADJ usage)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:01
S25	17235	(occupant NEAR10 detect\$3)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:05
S27	13997	(occupant NEAR6 detect\$3)	US- PGFUE; USPAT; USOCR; FPRS; EPO;	OR	ON	2018/06/11 19:06

			IBM TDB			
S29	9	S27 AND (occupant NEAR5 detect\$3) SAME (computer desktop) WITH use)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:07
S29	7	S27 AND (occupant NEAR5 detect\$3) SAME (CUB CLE)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:10
S30	8	smart ADJ building ADJ energy ADJ management	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:17
S31	1	(12/04/1472) APP.	USPAT; USOCR	OR	ON	2018/06/11 19:39
S32	181	"20030216837" "20040225645" "20050234596" "20050275525" "20060026972" "20080111818" "5087572" "6087477" "6004023" "6756598" "6792319" "8832120" "6812429" "7055759" "7130719" "7187986" "7349225" "7436292" "7440809" "7480534" "7529646").PN. OR ("7904209").UPPN.	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:39
S33	154	S32 AND (computer)	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S34	145	S32 AND (computer) AND user	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S35	76	S32 AND (computer) NEAR5 user	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S36	515045	(video SAME computer)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 13:58
S37	22410	S36 AND (video SAME computer) AND (monitor SAME temperature)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 13:58
S38	14573	S36 AND (video SAME computer) AND	US-	ON	ON	2018/12/20

		(monitor WITH temperature)	PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB			2018/12/20 14:00
S39	584	S36 AND (video SAME computer) SAME (monitor WITH temperature)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S40	553	S36 AND (video WITH computer) SAME (monitor WITH temperature)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S41	16	S36 AND (video WITH computer) SAME (monitor WITH temperature) SAME (user ADJ interface)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:01
S42	277	(monitor WITH temperature) SAME (user ADJ interface) AND (HVAC)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:06
S43	35	(monitor WITH temperature) SAME (user ADJ interface SAME (computer (laptop)) AND (HVAC)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:06
S44	0	(monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC) AND (probability AND activit AND user AND content AND video))	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:35
S45	0	(12/18/258) APP.	USPAT; USOCR	OR	ON	2018/12/20 14:53
S46	1	(12/04/1472) APP.	USPAT; USOCR	OR	ON	2018/12/20 14:56
S47	68545	G06D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/53; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:56
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						12:26
S53	1	("10289131")	USPAT	OR	ON	2019/05/01 12:27
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S56	0	("20110290893").PN	USPAT	OR	ON	2019/05/01 16:19
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S58	159	("STEINBERG") near3 ("John").INV.	US- PGPUB; USPAT; USOCR	OR	ON	2019/05/01 16:50
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S60	83	((("Steinberg") near3 ("John") near3 ("Douglas"))).INV.	US- PGPUB; USPAT; USOCR	OR	ON	2019/05/01 16:56
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				USCOR			
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573	17	309 AND (memory AND processor\$1)	US- PGPUB; USPAT;	OR	ON	2019/05/02 09:58

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S75	99	"EcoFactor") AS:ANM	US- PGPUB; USPAT; USOCC; PPRS; EPO; IBM TDB	OR	ON	2019/07/09 17:22
S76	21	S74 NOT S75	US- PGPUB; USPAT; USOCC; PPRS; EPO; IBM TDB	OR	ON	2019/07/09 17:22
S77	1	(12/778052).APP	USPAT; USOCC	OR	ON	2019/07/10 08:54
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S79	60	S78 AND (sensor\$1 AND (EEE))	US- PGFUB; USPAT; USCCR	OR	ON	2019/07/10 08:55
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S81	13	S79 AND (sensor\$1 AND (EEE)) NOT S80	US- PGFUB; USPAT; USCCR	OR	ON	2019/07/10 08:56

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S43	0	(monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC) AND (probability AND activ AND user AND content AND video).CLM.	USPAT	OR	ON	2018/12/20 14:35
S60	10068	F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12;	USPAT	OR	ON	2018/12/20 14:36

		F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc				
SG1	10169	G05D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1802; F24F11/66; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc	USPAT	OR	OK	2018/12/20 14:55

7/10/2019 5:36:57 PM

C:\Users\aojha\Documents\EAST\Workspaces\16374085.wsp

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374,085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
SHEET 1 OF 2	Examiner	Ojha, Ajay
	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	5,261,481	11/16/1993	Baldwin, et al.	
	2	5,761,083	06/02/1998	Brown, Jr., et al.	
	3	7,055,759	06/06/2006	Wacker, et al.	
	4	7,354,005	04/08/2008	Carey, et al.	
	5	7,565,225	07/21/2009	Dushane, et al.	
	6	7,802,618	09/28/2010	Simon, et al.	
	7	8,386,082	02/26/2013	Oswald	
	8	8,583,288	11/12/2013	Rossi, et al.	
	9	8,880,231	11/04/2014	Boucher, et al.	
	10	9,188,994 (EFACT.013C3)	11/17/2015	Steinberg	
	11	10,254,775 (EFACT.010C2)	04/09/2019	Cheung et al.	
	12	10,289,131 (EFACT.011C2)	05/14/2019	Steinberg	
	13	2003/0131623	07/17/2003	Suppes	
	14	2007/0044501	03/01/2007	Schnell, et al.	
	15	2008/0283621	11/20/2008	Quirino, et al.	
	16	2009/0013703	01/15/2009	Werner	
	17	2009/0216382	08/27/2009	Ng	
	18	2010/0019051	01/28/2010	Rosen	
	19	2011/0202181	08/18/2011	Lee, et al.	
	20	2012/0125592	05/24/2012	Fadell, et al.	
	21	2014/0352340	12/04/2014	Berg, et al.	
	22	2016/0258822 (EFACT.005C5)	09/08/2016	Steinberg, et al.	
	23	2019/0086106	03/21/2019	Okita et al.	
	24	2019/0086108	03/21/2019	Okita et al.	
	25	2019/0086109	03/21/2019	Okita et al.	
	26	2019/0086110	03/21/2019	Okita et al.	
	27	2019/0086882	03/21/2019	Okita et al.	
	28	2019/0089194	03/21/2019	Okita et al.	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.117

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374,085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
	Examiner	Ojha, Ajay
SHEET 2 OF 2	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	2019/0137133 (EFACT.007C3)	05/09/2019	Steinberg, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	30	Examination Report No. 2 in Australian Application No. 2013274827, dated May 22, 2017 (EFACT.014AU).

30649913

Examiner Signature /AJAY OJHA/	Date Considered 07/09/2019
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.118

Bibliographic Data

Application No: 16/374,085

Foreign Priority claimed: ☒ Yes ☐ No35 USC 119 (a-d) conditions met: ☒ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged:

/AJAY OJHA/

Examiner's Signature

Initials

Title:

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS
A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/03/2019	700	2824	EFACT.011C3
RULE			

APPLICANTS

EcoFactor, Inc., Redwood City, CA, UNITED STATES

INVENTORS

John Douglas Steinberg Millbrae, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 15002791 01/21/2016 PAT 10289131

15002791 is a CON of 13470074 05/11/2012 PAT 9244470

13470074 is a CON of 12502064 07/13/2009 PAT 8180492

12502064 has PRO of 61134714 07/14/2008

FOREIGN APPLICATIONS**IF REQUIRED, FOREIGN LICENSE GRANTED****

04/17/2019

**** SMALL ENTITY ******STATE OR COUNTRY**

UNITED STATES

ADDRESS

KNOBBE MARTENS OLSON & BEAR LLP

2040 MAIN STREET

FOURTEENTH FLOOR

IRVINE, CA 92614

UNITED STATES

FILING FEE RECEIVED

\$2,855

EFACT.011C3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Filed	: April 03, 2019
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ojha, Ajay
Art Unit	: 2824
Conf. No.	: 6894

RESPONSE TO OFFICE ACTION DATED MAY 8, 2019

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Office Action dated May 8, 2019, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 7 of this paper.

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Filing Date: April 03, 2019

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

the one or more processors with circuitry and code designed to execute instructions ~~configured~~ to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

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Filing Date: April 03, 2019

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.

2. (Currently Amended) The system of claim 1, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is unoccupied.

3. (Currently Amended) The system of claim 1, wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors with circuitry and code designed to execute instructions determines that the building is occupied.

4. (Original) The system of claim 2, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

5. (Original) The system of claim 4, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

6. (Currently Amended) The system of claim 4, wherein the one or more processors with circuitry and code designed to execute instructions ~~is further configured to query~~ queries the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

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7. (Currently Amended) The system of claim 5, wherein the one or more processors with circuitry and code designed to execute instructions ~~is further configured to receive~~ at least one setting of the HVAC system.

8. (Original) The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.

9. (Original) The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.

10. (Original) The system of claim 4, wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.

11. (Original) The system of claim 5, wherein the network connection is based on the IEEE 802.11 wireless protocol.

12. (Original) The system of claim 5, wherein the memory is further configured to store historical values of the first data and second data.

13. (Currently Amended) The system of claim 12, wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and not in electrical contact with the memory.

14. (Original) The system of claim 13, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

15. (Original) The system of claim 13, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

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16. (Currently Amended) The system of claim 5, wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

17. (Original) The system of claim 7, wherein the interface is configured to allow the user to turn the HVAC system on or off.

18. (Original) The system of claim 7, wherein the interface is configured to allow the user to input that the building is currently unoccupied.

19. (Currently Amended) A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and

one or more processors with circuitry and code designed to execute instructions;

the one or more processors with circuitry and code designed to execute instructions ~~configured~~ to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

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the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;

the one or more processors with circuitry and code designed to execute instructions ~~further configured~~ to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.

20. (Currently Amended) The system of claim 19, wherein the one or more processors comprises a first processor with circuitry and code designed to execute instructions that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

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REMARKS

The May 8, 2019 Office Action was based upon pending Claims 1-20. This Amendment amends Claims 1-3, 6, 7, 13, 16, 19, and 20. Thus, after entry of this Amendment, Claims 1-20 are pending and presented for further consideration.

PRIORITY

This application properly claims priority to U.S. Patent Application No. 15/002,791, filed May 11, 2011, and U.S. Provisional Application No. 61/134,714, filed July 14, 2008, and the intervening applications as stated in the Application Data Sheet filed on April 3, 2019. Applicant respectfully requests the Examiner to acknowledge the priority claim.

REJECTION OF CLAIMS FOR OBVIOUSNESS-TYPE DOUBLE PATENTING

The Examiner rejected the pending claims under obviousness-type double patenting as being unpatentable over the claims of U.S. Patent Nos. 10,289,131; 9,244,470; and 8,180,492. Applicant respectfully disagrees with the Examiner's position that Claims 1 and 19 are not patentably distinct over the indicated claims of the aforementioned patents due to numerous differences between the claims, including limitations not present in the indicated claims of the aforementioned patents. Further, Applicant respectfully submits that the Examiner has not properly set forth an obviousness-type double patenting rejection because the Office Action fails to adequately point out the alleged similarities between the claims on a limitation-by-limitation basis.

However, in the interest of advancing prosecution, Applicant submits herewith a Terminal Disclaimer in compliance with 37 C.F.R. § 1.321. Accordingly, Applicant respectfully requests that the obviousness-type double patenting rejection be withdrawn.

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REJECTION OF CLAIMS 19 AND 20 UNDER 35 U.S.C. § 112

Claims 19 and 20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended Claim 19 to provide antecedent basis for the limitation “data” and requests that this rejection be withdrawn.

REJECTION OF CLAIMS 1-20 ARE REJECTED UNDER 35 U.S.C. § 103(a)

Claims 1-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny (hereinafter “Podgorny”) in view of U.S. Publication No. 2010/0308119 to Steinberg (hereinafter “Steinberg”).

As stated above, the instant application properly claims priority back to U.S. Provisional Application No. 61/134,714, filed July 14, 2008. Accordingly, Applicant respectfully submits that the Examiner’s § 103 rejection is improper because the Steinberg reference does not qualify as prior art. At most, Steinberg would be entitled to a prior art date of May 12, 2009, the filing date of the provisional application that it claims priority to.

The Office Action relies on Steinberg as the basis of the § 103 rejection for a number of limitations that the Examiner acknowledges are not found in Podgorny. For example, in Claim 1, the Office Action cites Steinberg for at least these limitations:

a memory;

one or more processors; and

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building.

In Claim 19, the Office Action cites Steinberg for at least these limitations:

a memory;

one or more processors; and

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the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature.

Applicant submits that because Steinberg is not prior art, the Examiner has not made a prima facie case of obviousness and the § 103 rejection fails to render obvious at least Claims 1 and 19. Accordingly, Applicant submits that Claims 1 and 19, and their dependent claims, are in condition for allowance.

CLAIM AMENDMENTS

Although the originally filed Claims 1-20 demonstrated the novel, unconventional, and non-generic nature of the claimed processors' functionality, Applicant has amended Claims 1-3, 6, 7, 13, 16, 19, and 20 to further clarify the claimed processors.

Applicant respectfully submits that the submitted amendments overcome the Examiner's objections, and that the application is now in condition for allowance.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/994,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	12/502,064 Now Pat. 8,180,492	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Now Pat. 8,498,753	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Now Pat. 8,740,100	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Now Pat. 8,596,550	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Now Pat. 8,556,188	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Now Pat. 8,131,497	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Now Pat. 8,131,506	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Cheung et al.	13/219,381 Now Pat. 9,134,710	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Now Pat. 8,423,322	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	13/329,117 Now Pat. 8,340,826	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/409,697 Now Pat. 8,412,488	03/01/12	EFACT.004C2	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/409,729 Now Pat. 8,886,488	03/01/12	EFACT.005C2	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	13/470,074 Now Pat. 9,244,470	05/11/12	EFACT.011C1	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Hublou et al.	13/523,697 Now Pat. 10,048,706	06/14/12	EFACT.014A	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Steinberg	13/725,447 Now Pat. 8,712,590	12/21/12	EFACT.013C2	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/852,577 Now Pat. 8,738,327	03/28/13	EFACT.004C3	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	13/858,710 Now Pat. 8,751,186	04/08/13	EFACT.005C3	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/861,189 Now Pat. 9,057,649	04/11/13	EFACT.006C2	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	13/952,253 Published As 2013/0310989 Now Abandoned	07/26/13	EFACT.009C1	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	14/048,932 Now Pat. 8,840,033	10/08/13	EFACT.012C1	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/082,675 Now Pat. 9,194,597	11/18/13	EFACT.007C1	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/263,762 Now Pat. 9,188,994	04/28/14	EFACT.013C3	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	14/285,384 Published As 2015/0043615 Now Abandoned	05/22/14	EFACT.004C4	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	14/292,377 Now Pat. 9,279,594	05/30/14	EFACT.008C1	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg	14/491,554 Now Pat. 9,709,292	09/19/14	EFACT.012C2	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	14/527,433 Published As 2015/0120235 Now Abandoned	10/29/14	EFACT.005C4	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	14/731,221 Now Pat. 9,939,333	06/04/15	EFACT.006C3	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Cheung et al.	14/842,134 Now Pat. 10,254,775	09/01/15	EFACT.010C2	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	14/878,872 Now Pat. 10,018,371	10/08/15	EFACT.007C2	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/920,063 Published As 2016/0097557 Now Abandoned	10/22/15	EFACT.013C4	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg	15/002,791 Now Pat. 10,289,131	01/21/16	EFACT.011C2	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Steinberg	15/047,352 Now Pat. 9,982,905	02/18/16	EFACT.008C2	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/060,226 Published As 2016/0258822 Now Abandoned	03/03/16	EFACT.005C5	System And Method For Calculating The Thermal Mass Of A Building

Application No.: 16/374,085

Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	15/097,078 Published As 2016/0363337 Now Abandoned	04/12/16	EFACT.009C2	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	15/426,882 Published As 2017/0241662	02/07/17	EFACT.005C6	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	15/616,719 Published As 2017/0336090 Now Abandoned	06/07/17	EFACT.012C3	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Okita et al.	15/707,686 Published As 2019/0086882	09/18/17	EFACT.018A2	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,735 Published As 2019/0089194	09/18/17	EFACT.018A1	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,753 Published As 2019/0086109	09/18/17	EFACT.018A3	Occupancy Determination Using Energy Consumption Indications
Okita et al.	15/707,769 Published As 2019/0086110	09/18/17	EFACT.019A2	Systems And Methods For Acclimatization-Based Variable Thermostat Settings
Okita et al.	15/707,829 Published As 2019/0086108	09/18/17	EFACT.019A1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Okita et al.	15/707,873 Published As 2019/0086106	09/18/17	EFACT.019A3	Systems And Methods For Fan Delay-Based Variable Thermostat Settings
Okita et al.	15/713,318 Published As 2018/0087795	09/22/17	EFACT.017A2	Multi-Function Thermostat
Okita et al.	15/713,358 Published As 2018/0087793	09/22/17	EFACT.017A1	Multi-Function Thermostat

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	15/836,688 Published As 2018/0259400 Now Abandoned	12/08/17	EFACT.004C5	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	15/841,039 Published As 2018/0216841	12/13/17	EFACT.013C5	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	15/905,251 Published As 2018/0321093	02/26/18	EFACT.006D1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	15/965,339 Published As 2018/0313567	04/27/18	EFACT.008C3	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/994,532 Now Abandoned	05/31/18	EFACT.004C6	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	16/028,230 Published As 2019/0137133	07/05/18	EFACT.007C3	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Hublou et al.	16/033,565 Now Abandoned	07/12/18	EFACT.014C1	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Steinberg et al.	16/193,478	11/16/18	EFACT.007C4	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	16/193,530	11/16/18	EFACT.004C7	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	16/264,050	01/31/19	EFACT.012C4	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	16/277,682	02/15/19	EFACT.005C7	System And Method For Calculating The Thermal Mass Of A Building
Hublou et al.	16/287,366	02/27/19	EFACT.014C2	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Okita et al.	16/290,111	03/01/19	EFACT.019A1C1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Steinberg et al.	16/290,226	03/01/19	EFACT.009C3	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	16/295,272	03/07/19	EFACT.004C8	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	16/295,402	03/07/19	EFACT.010C3	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	16/295,436	03/07/19	EFACT.007C5	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat

Application No.: 16/374,085
Filing Date: April 03, 2019

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	16/374,083	04/03/19	EFACT.006C4	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	16/374,085	04/03/19	EFACT.011C3	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Steinberg	16/374,246	04/03/19	EFACT.012C5	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing references for consideration. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

Application No.: 16/374,085
Filing Date: April 03, 2019

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: June 12, 2019

By: /John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

30655196

INFORMATION DISCLOSURE STATEMENT

First Inventor	: John Douglas Steinberg
App. No.	: 16/374,085
Filed	: April 3, 2019
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ajay Ojha
Art Unit	: 2824
Conf. No.	: 6894

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after receipt of a First Office Action, but before the mailing date of a Final Action and before the mailing date of a Notice of Allowance.

Application No.: 16/374,085
Filing Date: April 3, 2019

This Statement is accompanied by the fees set forth in 37 CFR 1.17(p). The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: June 12, 2019

By: John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

30649948

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374,085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
	Examiner	Ojha, Ajay
SHEET 1 OF 2	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	5,261,481	11/16/1993	Baldwin, et al.	
	2	5,761,083	06/02/1998	Brown, Jr., et al.	
	3	7,055,759	06/06/2006	Wacker, et al.	
	4	7,354,005	04/08/2008	Carey, et al.	
	5	7,565,225	07/21/2009	Dushane, et al.	
	6	7,802,618	09/28/2010	Simon, et al.	
	7	8,386,082	02/26/2013	Oswald	
	8	8,583,288	11/12/2013	Rossi, et al.	
	9	8,880,231	11/04/2014	Boucher, et al.	
	10	9,188,994 (EFACT.013C3)	11/17/2015	Steinberg	
	11	10,254,775 (EFACT.010C2)	04/09/2019	Cheung et al.	
	12	10,289,131 (EFACT.011C2)	05/14/2019	Steinberg	
	13	2003/0131623	07/17/2003	Suppes	
	14	2007/0044501	03/01/2007	Schnell, et al.	
	15	2008/0283621	11/20/2008	Quirino, et al.	
	16	2009/0013703	01/15/2009	Werner	
	17	2009/0216382	08/27/2009	Ng	
	18	2010/0019051	01/28/2010	Rosen	
	19	2011/0202181	08/18/2011	Lee, et al.	
	20	2012/0125592	05/24/2012	Fadell, et al.	
	21	2014/0352340	12/04/2014	Berg, et al.	
	22	2016/0258822 (EFACT.005C5)	09/08/2016	Steinberg, et al.	
	23	2019/0086106	03/21/2019	Okita et al.	
	24	2019/0086108	03/21/2019	Okita et al.	
	25	2019/0086109	03/21/2019	Okita et al.	
	26	2019/0086110	03/21/2019	Okita et al.	
	27	2019/0086882	03/21/2019	Okita et al.	
	28	2019/0089194	03/21/2019	Okita et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T1 - Place a check mark in this area when an English language Translation is attached.

B.141

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	16/374,085
	Filing Date	April 3, 2019
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
	Examiner	Ojha, Ajay
SHEET 2 OF 2	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number <i>Number - Kind Code (if known)</i> Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	2019/0137133 (EFACT.007C3)	05/09/2019	Steinberg, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document <i>Country Code-Number-Kind Code</i> Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	30	Examination Report No. 2 in Australian Application No. 2013274827, dated May 22, 2017 (EFACT.014AU).

30649913

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.142

Electronic Patent Application Fee Transmittal				
Application Number:		16374085		
Filing Date:		03-Apr-2019		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Amy Durrant		
Attorney Docket Number:		EFACT.011C3		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
Total in USD (\$)				120

Electronic Acknowledgement Receipt

EFS ID:	36278136
Application Number:	16374085
International Application Number:	
Confirmation Number:	6894
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/ThuyQuyen Nguyen
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C3
Receipt Date:	12-JUN-2019
Filing Date:	03-APR-2019
Time Stamp:	14:31:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$120
RAM confirmation Number	061319INTEFSW14322500
Deposit Account	111410
Authorized User	ThuyQuyen Nguyen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

B.145

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C3_response.pdf	84684 e01a1c1e8fa1e1d375ce622266312d5d3722a14	yes	19
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	6	
	Applicant Arguments/Remarks Made in an Amendment		7	19	
Warnings:					
Information:					
2		EFACT-011C3_IDS.pdf	43441 d67c480ca9c93da7c3724501139c850dda4c4d8c	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	4	
Warnings:					
Information:					
3	Non Patent Literature	EFACT-011C3_REF.pdf	177778 .9f20c336c6d95cc3a7f8c91a130c5d5a9c9f1d	no	2
Warnings:					
Information:					

4	Fee Worksheet (SB06)	fee-info.pdf	30798 08aace667d7623fe5d38320a7902e35583a ad72	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	336701
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: DIST.E.FILE

Document Description: Electronic Terminal Disclaimer - Filed

U.S. Patent and Trademark Office
Department of Commerce

Electronic Petition Request	TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT
Application Number	16374085
Filing Date	03-Apr-2019
First Named Inventor	John Steinberg
Attorney Docket Number	EFACT 011C3
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
EcoFactor, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s):

10289131

9244470

8180492

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.
- ☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

- ☒ Small Entity
- ☐ Micro Entity
- ☐ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

- ☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application
- Registration Number 34362
- ☐ A sole inventor
- ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application
- ☐ A joint inventor; all of whom are signing this request

Signature	/John R. King/
Name	John R. King

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
Application Number:		16374085		
Filing Date:		03-Apr-2019		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Evelyn Salcido		
Attorney Docket Number:		EFACT.011C3		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16374085

Filing Date: 03-Apr-2019

Applicant/Patent under Reexamination: Steinberg

Electronic Terminal Disclaimer filed on June 12, 2019

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	36279641
Application Number:	16374085
International Application Number:	
Confirmation Number:	6894
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Evelyn Salcido
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C3
Receipt Date:	12-JUN-2019
Filing Date:	03-APR-2019
Time Stamp:	18:18:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$160
RAM confirmation Number	061319INTEFSW18185100
Deposit Account	111410
Authorized User	Evelyn Salcido

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

B.153

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	34004	no	2
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Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	30863	no	2
			1c51e01e6412ce622eada2ba87c70c0f98d16a5		

Warnings:**Information:**

Total Files Size (in bytes):	64867
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Serial Number		Filing Date	
Substitute for Form PTO 876				62/374,085		04/03/2019	
ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO							
APPLICATION AS FILED - PART I							
FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE (\$)		FEE (\$)	
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A			
TOTAL CLAIMS (37 CFR 1.16(a))	minus 20 = *			x \$50 =			
INDEPENDENT CLAIMS (37 CFR 1.16(a))	minus 5 = *			x \$230 =			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(c))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(B) and 37 CFR 1.15(c).						
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT* (37 CFR 1.16(d))							
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL			
APPLICATION AS AMENDED - PART II							
AMENDMENT	06/12/2019	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(a))	* 20	Minus ** 20	= 0	x \$50 =	0	
	Independent (37 CFR 1.16(a))	* 2	Minus *** 5	= 0	x \$230 =	0	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))						
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
					TOTAL ADDL. FEE		0
AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(a))	*	Minus **	=	x \$0 =		
	Independent (37 CFR 1.16(a))	*	Minus ***	=	x \$0 =		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))						
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
					TOTAL ADDL. FEE		
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.					LIE		
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "00"					/AMANDA N FORD/		
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 5, enter "0"							
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.							

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to be (and by the USPTO to) process an application. Confidentiality is guaranteed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 10 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22304-1450. DO NOT SEND FILED OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-0199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EFACT.011C3	6894
20995	7590	05/08/2019	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			OJHA, AJAY	
2040 MAIN STREET			ART UNIT	PAPER NUMBER
FOURTEENTH FLOOR				
IRVINE, CA 92614			2824	
			NOTIFICATION DATE	DELIVERY MODE
			05/08/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com

jayna.cartee@knobbe.com

Office Action SummaryApplication No.
16/374,085Applicant(s)
Steinberg, John DouglasExaminer
AJAY CHAArt Unit
2824AIA (FITF) Status
No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for ReplyA SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.135(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.

Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may require any earned patent term adjustment. See 37 CFR 1.704(c).

Status1) ☒ Responsive to communication(s) filed on Application filed 04/03/2019.☐ A declaration(s)/affidavit(s) under 37 CFR 1.135(b) was/were filed on _____.2a) ☐ This action is FINAL.2b) ☒ This action is non-final.3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.**Disposition of Claims***5) ☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.7) ☒ Claim(s) 1-20 is/are rejected.8) ☐ Claim(s) _____ is/are objected to.9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.**Application Papers**10) ☐ The specification is objected to by the Examiner.11) ☒ The drawing(s) filed on 04/03/2019 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 11912) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(c) or (f).**Certified copies:**a) ☒ All b) ☐ Some** c) ☐ None of the:1) ☒ Certified copies of the priority documents have been received.2) ☐ Certified copies of the priority documents have been received in Application No. _____.3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)1) ☐ Notice of References Cited (PTO-892)3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date _____

2) ☒ Information Disclosure Statement(s) (PTO/83-08a and/or PTO/56-08b)4) ☐ Other: _____

Paper No(s)/Mail Date _____

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DETAILED ACTION

General Remarks

1. The present application is being examined under the **pre-AIA** first to invent provisions.
2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.
3. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
4. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
5. Applicants seeking an interview with the examiner, including **WebEx Video Conferencing**, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
6. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 19.
 - b. Pending: 1-20.

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IDS

7. Applicant's IDS(s) submitted on 04/03/2019 is/are in compliance with the provisions of 37

CFR 1.97. Accordingly, the information disclosure statement has/have considered by the examiner and made of record.

Priority

8. This application makes reference to *or appears* to claim subject matter disclosed in Application No. **15/002791, filed 01/21/2016**. If applicant desires to claim the benefit of a prior-filed application under 35 U.S.C. 119(e), 120, 121, 365(c) or 386(c), the instant application must contain, or be amended to contain, a specific reference to the prior-filed application in compliance with 37 CFR 1.78. If the application was filed before September 16, 2012, the specific reference must be included in the first sentence(s) of the specification following the title or in an application data sheet (ADS) in compliance with pre-AIA 37 CFR 1.76; if the application was filed on or after September 16, 2012, the specific reference must be included in an ADS in compliance with 37 CFR 1.76. For benefit claims under 35 U.S.C. 120, 121, 365(c), or 386(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications.

If the instant application is a utility or plant application filed under 35 U.S.C. 111(a), the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a national stage application under 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f), four months from the date of the initial submission under 35 U.S.C. 371 to enter the national stage, or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(4) for benefit claims under 35 U.S.C. 119(e) and 37 CFR 1.78(d)(3) for benefit claims under 35 U.S.C. 120, 121, 365(c), or 386(c). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121, 365(c), and 386(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e) (see 37 CFR 1.78(c)) or under 35 U.S.C. 120, 121, 365(c), or 386(c) (see 37 CFR 1.78(e)). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and by 37 CFR 1.78 to the prior application (unless previously submitted), (2) the petition fee under 37 CFR 1.17(m), and (3) a statement that the entire delay between the date the benefit claim was due under 37 CFR 1.78 and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78 but was not included in the location in the application required by the rule (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78 and the petition fee under 37 CFR 1.17(m) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78 by filing an ADS in compliance with 37 CFR 1.76 with the reference (or, if the application was filed before September

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16, 2012, by filing either an amendment to the first sentence(s) of the specification or an ADS in compliance with pre-AIA 37 CFR 1.76). See MPEP § 211.02.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

10. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(I)(1) - 706.02(I)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

11. The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTO-info-1.jsp.

12. **Claim(s) 1 and 19 rejected on the ground of nonstatutory double patenting as being**

unpatentable over claim(s) 10 and 12 of prior US 10289131, US 9244470 and US 8180492 as indicated

in the below table. Although the claims at issue are not identical, they are not patentably distinct

from each other as disclosed in the table below.

Instant Application Claim(s)	10,289,131 Patent Claim(s)
1. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external	10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint; at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface that can be used to view video content, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user

<p>to the building; the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied; the one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.</p>	<p>interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint, said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by <u>the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints</u>; said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and wherein said application in response to said prompting, receives input from said one or more users; and wherein said current temperature setpoint is set based upon said input from said one or more users.</p>
<p>19. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature; the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired</p>	<p>10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint; at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface <u>that can be used to view video content</u>, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint, said application determining a probability that the specific</p>

<p>temperature setting when the building is unoccupied; the one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data; the one or more processors further configured to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.</p>	<p>activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by <u>the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints</u>; said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and wherein said application in response to said prompting, receives input from said one or more users; and wherein said current temperature setpoint is set based upon said input from said one or more users.</p>
<p>Instant Application Claim(s)</p>	<p>9,244,470 Patent Claim(s)</p>
<p>1. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building; the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied; the one or more processors further configured to receive commands through the Internet by</p>	<p>10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the presence of one or more occupants in said structure; at least one wireless device associated with said one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors in communication with a storage medium comprising computer accessible memory, the application receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint that</p>

<p>way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.</p>	<p>indicates said structure is not occupied, said application determining a probability that specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by at least one specific occupant of said structure; said application determining that said at least one specific occupant has previously indicated a preference that input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device; said application prompting said at least one specific occupant based on said determining that said input should be obtained, wherein said application provides electronic notice to said at least one specific occupant of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and wherein said application in response to said prompting, receives said input from said at least one specific occupant; and wherein said current temperature setpoint is set based upon said input from said at least one specific occupant.</p>
<p>19. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature; the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied; the</p>	<p>10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the presence of one or more occupants in said structure; at least one wireless device associated with said one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors in communication with a storage medium comprising computer accessible memory, the application receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint that indicates said</p>

<p>one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data; the one or more processors further configured to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.</p>	<p>structure is not occupied, said application determining a probability that specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by at least one specific occupant of said structure; said application determining that said at least one specific occupant has previously indicated a preference that input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device; said application prompting said at least one specific occupant based on said determining that said input should be obtained, wherein said application provides electronic notice to said at least one specific occupant of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and wherein said application in response to said prompting, receives said input from said at least one specific occupant; and wherein said current temperature setpoint is set based upon said input from said at least one specific occupant.</p>
Instant Application Claim(s)	8,180,492 Patent Claim(s)
<p>1. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building; the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied; the one or more processors further configured to</p>	<p>12. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the existence of occupants in said structure; one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint; wherein said</p>

<p>receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.</p>	<p>electronic devices and said thermostat are connected to a network; an application comprising one or more computer processors in communication with said network, wherein said application determines whether said one or more electronic devices are in use and in response, whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied, said application determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing said first HVAC temperature setpoint to said second HVAC temperature setpoint indicating that said structure is deemed to be occupied: said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said application provides electronic notice to one or more of said users of said electronic-devices that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint ; and wherein said application in response to said prompting, receives input from said one or more users to keep said first HVAC temperature setpoint: and wherein said said-thermostat is kept at said first temperature setpoint based upon said input from said one or more usersuser response to said electronicnotice.</p>
<p>19. A system for controlling an HVAC system at a user's building, the system comprising: a memory; and one or more processors; the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor; the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature; the one or more processors further configured to receive</p>	<p>12. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the existence of occupants in said structure; one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of</p>

<p>a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied; the one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system; the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the data, wherein the user-specific information is presented on a website accessible through the Internet; the one or more processors further configured to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data; the one or more processors further configured to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.</p>	<p>one or more of said electronic devices by one or more users wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint; wherein said electronic devices and said thermostat are connected to a network; an application comprising one or more computer processors in communication with said network, wherein said application determines whether said one or more electronic devices are in use and in response, whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied, said application determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing said first HVAC temperature setpoint to said second HVAC temperature setpoint indicating that said structure is deemed to be occupied; said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said application provides electronic notice to one or more of said users of said electronic-devices that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint ; and wherein said application in response to said prompting, receives input from said one or more users to keep said first HVAC temperature setpoint: and wherein said said- thermostat is kept at said first temperature setpoint based upon said input from said one or more usersuser response to said electronic notice.</p>
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Claim Rejections - 35 USC § 112

13. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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14. **Claim 19-20 rejected under 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or the applicant regards as the invention.**

Independent Claim 19 (and dependent claim 20), recites the limitation "data" in line 23. There is insufficient antecedent basis for this limitation in the claim. Based on context this limitation will be interpreted as "user-specific data".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

15. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. **Claim(s) 1-20 is/are rejected under AIA 35 U.S.C. 103 as being unpatentable over US 20080281472 (hereinafter "Podgorny") in view of US 20100308119 A1 (hereinafter "Steinberg").**

Re: Independent Claim 1, Podgorny discloses a system for controlling an HVAC system at a user's building (Podgorny Figs. 1-22), the system comprising:

the one or more processors configured to receive a first data from at least one sensor (Podgorny Fig. 22: Built-in Humidity and Temp. Sensor interfaced to microcontroller or processor as set forth below), wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building (Podgorny ¶ [0070], [0097], [0099], [0148] disclosed reading values from various sensors);

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the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0091]-[0092] and [0019] "user preferences stored" in "occupied/non-occupied"), and

a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

the one or more processors further configured to receive commands through the Internet by way of a remote interface (Podgorny Fig. 21 and at least ¶¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices" and [0142] "The System provides a graphical User Interface 2100...");

wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system (Podgorny ¶¶ [0019], [0089]-[0092] "occupancy sensor shuts the system down when users are away from their workstations" disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors further configured to send user-specific data through the Internet (Podgorny ¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices."),

wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data (Podgorny ¶ [0021] "The system is able to customize environmental properties of the building spaces to align them with the preferences declared by the individual users....maintain the environmental parameters temperature"; see also ¶¶ [0008], [0029]-[0030] and [0063]),

wherein the user-specific information is presented on a website accessible through the Internet (Podgorny Fig. 21 and at least ¶¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices" and [0142] "The System provides a graphical User Interface 2100...");

the one or more processors further configured to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature (Podgorny ¶¶ [0019], [0089]-[0092] "occupancy sensor shuts the system down when users are away from their workstations" disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Podgorny is silent regarding:

a memory; and

one or more processors;

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building;

Steinberg discloses:

a memory (Steinberg Fig. 4: Memory); and

one or more processors (Steinberg Fig. 4: Processor);

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building (Steinberg Fig. 2 and ¶ [0028]: Database 106 external to user environments/buildings);

Podgorny and Steinberg disclose home automation and HVAC control system. Steinberg discloses explicit implementation of the home automation and HVAC control system based on in part a microprocessor, memory, communication module, display etc. It would have been obvious to a person

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of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and implement the system using generic computing components such as generic microprocessor and memories for flexible programming and control of the HVAC system including over the internet (Steinberg ¶¶ [0016]-[0027]).

Re: Claim 2, Podgorny and Steinberg discloses all the limitations of claim 1 on which this claim depends. They further disclose:

wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied, in the event the one or more processors determines that the building is unoccupied (Podgorny ¶¶ [0019], [0089]-[0092] “...occupancy sensor shuts the system down when users are away from their workstations”).

Re: Claim 3, Podgorny and Steinberg discloses all the limitations of claim 1 on which this claim depends. They further disclose:

wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors determines that the building is occupied (Podgorny ¶¶ [0019], [0089]-[0092] “...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...”).

Re: Claim 4, Podgorny and Steinberg discloses all the limitations of claim 2 on which this claim depends. They further disclose:

wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor (Podgorny ¶ [0097] discloses “...Read temperature...”, ¶

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[0104] provides an example of reading a temperature "...reading from the device thermometer01 was 75 degrees...").

Re: Claim 5, Podgorny and Steinberg discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the second data from the network connection comprises a measurement of the current outdoor temperature (Steinberg Figs. 5 and 6a make it obvious that external temperature measurement data is available in temperature database 400).

Re: Claim 6, Podgorny and Steinberg discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the one or more processors is further configured to query the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied (Podgorny Table 1 "...establishes user presence in a zone based on a reading from a presence sensor", ¶ [0083] "...detects the presence of the user... notifies Smart Building Framework 100 about identity of the logged in user...", ¶ [0093] "...present invention offers certain niceties, such as biometrics identifying the person... full control of PEM control elements, as well as providing additional temperature and humidity..." and thus after identifying the user the system is capable of adjusting environment to user preferences).

Re: Claim 7, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

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wherein the one or more processors is further configured to receive at least one setting of the HVAC system (Podgorny Fig. 14 and ¶¶ [0019], [0089]-[0092] "...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...").

Re: Claim 8, Podgorny and Steinberg discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off (Podgorny ¶¶ [0019], [0089]-[0092] "occupancy sensor shuts the system down when users are away from their workstations" disclose system/processor able to determine current status of HVAC).

Re: Claim 9, Podgorny and Steinberg discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode (e.g. Podgorny ¶ [0104] "...Current status of active devices; and/or, heating module in device PEM01 is on." So there is at least a heating mode).

Re: Claim 10, Podgorny and Steinberg discloses all the limitations of claim 4 on which this claim depends. They further disclose:

wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor (e.g. Podgorny Table 3 discloses sensing of user presence using motion detector "...users are present... shall be determined by...sensor devices. An example of such sensor devices is a motion detector...").

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Re: Claim 11, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the network connection is based on the IEEE 802.11 wireless protocol (Steinberg Fig. 4 and ¶ [0030] "...wireless protocols such as IEEE 802.11...").

Re: Claim 12, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the memory is further configured to store historical values of the first data and second data (Steinberg Fig. 5 contains various sensor databases).

Re: Claim 13, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory (Steinberg Fig. 2: 104s).

Re: Claim 14, Podgorny and Steinberg discloses all the limitations of claim 13 on which this claim depends. They further disclose:

wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor (Podgorny ¶¶ [0019], [0089]-[0092] "...allows to read/write settings for: Temperature Selection...Occupied/Unoccupied Status...").

Re: Claim 15, Podgorny and Steinberg discloses all the limitations of claim 13 on which this claim depends. They further disclose:

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wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Re: Claim 16, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor (Steinberg Fig. 2 shows remote configuration of multiple sensors in a network).

Re: Claim 17, Podgorny and Steinberg discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the interface is configured to allow the user to turn the HVAC system on or off (Podgorny ¶ [0021] “...Manual administrative control: The system provides means for an authorized personnel administrator to monitor the status of the system and set the global, overriding goals for the system...”; Fig. 21 shows a user GUI that can be used to turn HVAC on/off by manipulating temp./humidity settings, when applied the system may turn on/off to meet the updated environmental conditions).

Re: Claim 18, Podgorny and Steinberg discloses all the limitations of claim 7 on which this claim depends. They further disclose:

wherein the interface is configured to allow the user to input that the building is currently unoccupied (Podgorny ¶ [0099] discloses occupancy state can be set to occupied or unoccupied using "...EO set occupancy state...").

Re: Independent Claim 19, Podgorny discloses a system for controlling an HVAC system at a user's building (Podgorny Figs. 1-22), the system comprising:

the one or more processors configured to receive a first data from at least one sensor (Podgorny Fig. 22: Built-in Humidity and Temp. Sensor interfaced to microcontroller or processor as set forth below), wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor (Podgorny ¶ [0070], [0097], [0099], [0148] disclosed reading values from various sensors);

the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0091]-[0092] and [0019] "user preferences stored" in "occupied/non-occupied"), and

a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

the one or more processors further configured to receive commands through the Internet by way of a remote interface (Podgorny Fig. 21 and at least ¶¶ [0024] "...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices" and [0142] "The System provides a graphical User Interface 2100...");

wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system (Podgorny ¶¶ [0019], [0089]-[0092] "occupancy sensor shuts the system down when

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users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors further configured to send user-specific data through the Internet (Podgorny ¶ [0024] “...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices.”),

wherein user-specific information about the building and HVAC system is generated based at least in part on the *user-specific data* (Podgorny ¶ [0021] “The system is able to customize environmental properties of the building spaces to align them with the preferences declared by the individual users....maintain the environmental parameters temperature”; see also ¶¶ [0008], [0029]-[0030] and [0063]),

wherein the user-specific information is presented on a website accessible through the Internet (Podgorny Fig. 21 and at least ¶¶ [0024] “...the overall system design is Internet-centric, uses Web Services, and assumes IP addressability of all system elements, including sensors and control devices” and [0142] “The System provides a graphical User Interface 2100...”);

the one or more processors further configured to receive a third data from a motion sensor (Podgorny ¶ [0010] discloses use of motion sensor to adjust comfort level; therefore this limitation has been taught), and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system down when users are away from their workstations” disclose system/processor able to determine presence/absence of user and adjust environmental parameters);

the one or more processors further configured to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied (Podgorny ¶¶ [0019], [0089]-[0092] “occupancy sensor shuts the system

down when users are away from their workstations" disclose system/processor able to determine presence/absence of user and adjust environmental parameters).

Podgorny is silent regarding:

a memory; and

one or more processors;

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature;

Steinberg discloses:

a memory (Steinberg Fig. 4: Memory); and

one or more processors (Steinberg Fig. 4: Processor);

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature (Steinberg Fig. 2 and ¶ [0028]: Database 106 external to user environments/buildings and stores temperature data, additionally ¶ [0034] discloses "...comparing outside temperature..." hence outside temperature is collected);

Podgorny and Steinberg disclose home automation and HVAC control system. Steinberg discloses explicit implementation of the home automation and HVAC control system based on in part a microprocessor, memory, communication module, display etc. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and implement the system using generic computing components such as generic microprocessor and memories for flexible programming and control of the HVAC system including over the internet (Steinberg ¶¶ [0016]-[0027]).

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Re: Claim 20, Podgorny and Steinberg discloses all the limitations of claim 5 on which this claim depends. They further disclose:

wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor (Steinberg Fig. 2 shows remote configuration of multiple sensors in a network).

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Conclusion


17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is (571)272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <https://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/
Primary Examiner, Art Unit 2824
ajay.ojha@uspto.gov

Search Notes 	Application/Control No. 16/374,085	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	05/03/2019	AO

CPC Combination Sets - Searched*		
Symbol	Date	Examiner


US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search.	05/03/2019	AO

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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<p><i>Index of Claims</i></p> 	<p>Application/Control No.</p> <p>16/374,085</p>	<p>Applicant(s)/Patent Under Reexamination</p> <p>Steinberg, John Douglas</p>
	<p>Examiner</p> <p>AJAY GUHA</p>	<p>Art Unit</p> <p>2824</p>

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

[illegible]

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	149	(("STEINBERG") near3 ("John")) .INV.	US- PGFUS; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	("EcoFactor") AS.AANM.	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 09:40
S3	45553	(F24F11/005; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/50; F24F2120/12; F24F2120/10; F24F11/63; F24F11/48; F24F2120/20; F24F2140/60; F24F2120/14) .cpc.	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND use:S1 AND wireless).CJIA.	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:03
S5	15	("9244470")	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:11
S6	9	("9244470")	USPAT	OR	ON	2018/02/07 10:12
S7	25	("20040117330" "20090065596" "20150025691" "6780224" "20130173064" "20040133014" "5348074" "7869907" "8850348" "9057949" "20140318581" "20150120235" "7206670" "20130178885") .PN	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:05
S8	4	("20080261472" "20090065596")	US- PGFUS; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:12
S10	32	US-20010025349-5 US-20040117330-5 US-20040133014-5 US-20080083834-5	US- PGFUS;	OR	ON	2018/05/11 10:22

B.182

		US-20090005070-\$ US-20090018873-\$ USPAT; US-20090057428-\$ US-20090062970-\$ USOCR; US-20090271013-\$ US-20130073094-\$ FPPS; US-20170241662-\$ US-20170336090-\$ EPO; US-20180087795-\$ US-20180087795-\$ IBM_TDB US-1234567-\$ US-4270693-\$ US- 4702305-\$ US-4702413-\$ US-6297838- \$ US-6454511-\$ US-6706190-\$ US- 6839654-\$ US-6216956-\$ US-6223544- \$ US-6449534-\$ US-6454177-\$ US- 6845918-\$ US-6981383-\$ US-7983795- \$ US-9709292-\$ US-9939333-\$).DID.				
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S12	9	"20160061474" "9244470" "9279594" "20060283968" "20080083234" "20090065596").PN	US- PGPUB; USPAT; USOCR; FPPS; EPO; IBM_TDB	OR	ON	2018/08/11 18:33
S13	3	(WO-2009036764-\$).DID.	US- PGPUB; USPAT; USOCR; FPPS; EPO; IBM_TDB	OR	ON	2018/08/11 18:38
S14	0	(desktop ADJ us\$3 WITH control ACUS temperature)	US- PGPUB; USPAT; USOCR; FPPS; EPO; IBM_TDB	OR	ON	2018/08/11 18:38
S15	18	(desktop ADJ us\$3 WITH control WITH environment)	US- PGPUB; USPAT; USOCR; FPPS; EPO; IBM_TDB	OR	ON	2018/08/11 18:43
S16	147	(desktop ADJ usage)	US- PGPUB; USPAT; USOCR; FPPS; EPO; IBM_TDB	OR	ON	2018/08/11 18:49
S17	0	S16 AND (desktop ADJ usage WITH air\$conditioning)	US- PGPUB;	OR	ON	2018/08/11 18:50

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			USPAT; USOCR; FPRS; EPO; IBM TDB			
S19	11	S16 AND (desktop ADJ usage WITH environment\$2)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:51
S19	0	S16 AND (smart SAME room ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:55
S20	0	(smart SAME room ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:56
S21	0	(smart ADJ temperature ADJ control)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:58
S22	0	(wireless ADJ device ADJ aware WITH thermostat)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 18:56
S23	2074	(smart ADJ thermostat)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:00
S24	6	S23 AND (smart ADJ thermostat) SAME ((computer desktop TV) ADJ usage)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:01
S25	17235	(occupant NEAR10 detect\$3)	US- PGFUE; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:05

S27	13997	(occupant NEAR5 detect\$3)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:06
S28	9	S27 AND (occupant NEAR5 detect\$3) SAME ((computer desktop) WITH use)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:07
S29	7	S27 AND (occupant NEAR5 detect\$3) SAME (OUB CLE)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:10
S30	8	smart ADU building ADU energy ADU management	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/06/11 19:17
S31	1	(12/041472).APP	USPAT; USOCR	OR	ON	2018/06/11 19:39
S32	181	("20030216537" "20040225649" "20050234596" "20050275525" "20060026572" "20060111818" "6097672" "6067477" "6604023" "6766998" "6792313" "6832120" "6912429" "7055759" "7130719" "7187986" "7343228" "7436292" "7440809" "7469534" "7529646").PN OR ("7604209").URPN	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:39
S33	154	S32 AND (computer)	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S34	143	S32 AND (computer) AND user	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S35	76	S32 AND (computer) NEAR10 user	US- PGFUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S36	815046	(video SAME computer)	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 13:58
S37	22410	S36 AND (video SAME computer) AND (monitor SAME temperature)	US- PGFUB;	OR	ON	2018/12/20 13:59

			USPAT; USOCR; FPRS; EPO; IBM TDB			
S35	14673	S36 AND (video SAME computer) AND (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S39	884	S36 AND (video SAME computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S40	853	S36 AND (video WITH computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:00
S41	18	S36 AND (video WITH computer) SAME (monitor WITH temperature) SAME (user ADJ interface)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:01
S42	277	(monitor WITH temperature) SAME (user ADJ interface) AND (HVAC)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:05
S43	35	(monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:06
S44	0	((monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC) AND (probability AND activit AND user AND context AND video))	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:36
S45	0	(12/181258) APP.	USPAT; USOCR	OR	ON	2018/12/20 14:53
S46	1	(12/641472) APP.	USPAT; USOCR	OR	ON	2018/12/20 14:55
S47	68546	G05D23/90; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02;	US- PGPUB;	OR	ON	2018/12/20 14:56

		G06N7:005; G06D23:1902; F24F11:56; F24F2120:12; F24F2120:10; F24F11:53; F24F11:46; F24F2120:20; F24F2140:50; F24F2120:14).cpc.	USPAT; USOCR; PPRS; EPC; ISM, TDB			
S62	2	("15002791" "13470074" "12502064")	USPAT	OR	ON	2019/05/01 12:26
S63	1	("10289131")	USPAT	OR	ON	2019/05/01 12:27
S64	0	("10289131").PN	USPAT	OR	ON	2019/05/01 12:27
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S66	0	("20110290893").PN	USPAT	OR	ON	2019/05/01 18:19
S67	1	("20110290893").PN	US FGFUB; USPAT	OR	ON	2019/05/01 18:19
S68	159	(("STEINBERG") near3 ("John")).INV.	US- FGFUB; USPAT; USOCR	OR	ON	2019/05/01 18:50
S69	87	S68 AND (@p3<"20110401")	US- FGFUB; USPAT; USOCR	OR	ON	2019/05/01 18:50
S60	83	((("Steinberg") near3 ("John") near3 ("Douglas"))).INV.	US- FGFUB; USPAT; USOCR	OR	ON	2019/05/01 18:56
S61	1	(12/768246).APP	USPAT; USOCR	OR	ON	2019/05/01 18:59
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 USPAT;
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18:59

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		6594825 *6595430* *6598056* *6619555* *6622097* *6622115* *6622925* *6622928* *6626937* *6633823* *6643587* *6644098* *6671586* *6695218* *6700224* *6726113* *6731992* *6734806* *6772052* *6785592* *6785630* *6786421* *6789739* *6845918* *6853959* *6868293* *6868319* *6882712* *6889908* *6891838* *6912429* *6981383* *6991029* *7009493* *7031885* *7039532* *7061393* *7089088* *7130719* *7130832* *7187079* *7187986* *7206892* *7206670* *7215746* *7216015* *7231424* *7232078* *7242988* *7260823* *7356384* *7476020* *7483984* *7500489* *7544869* *7702424* *7758729* *7784704* PNL OR (*7848900* *7868904* *7894943* *7908116* *7908117* *7963796* *8010237* *8019567* *8090477* *8131497* *8131506* *8180492* *8340828* *8412488* *8423323* *8428752* *8428785* *8437797* *8498753* *8556188* *8586550* *8712590* *8738327* *8740100* *8751166* *8840033* *8850348* *8866488* *9067549* *9134710* *9194697* *9244470* *9279894* *9709292* *D648990* *D659560* *D673467* *D705095* *H032178* PNL OR (*9939333*) UFPN.				
S69	20	US-20070290621-\$ or US-20100318227-\$ or US-20100308119-\$ or US-20100282857-\$ or US-20100070234-\$ or US-20100380667-\$ or US-20100970084-\$ or US-20060045105-\$ or US-20100289643-\$ or US-20090052859-\$ or US-20090271013-\$ or US-20090065596-\$ or US-20130144453-\$ or US-20090098599-\$ or US-20100262290-\$ did. or (US-9244470-\$ or US-8891638-\$ or US-8622925-\$ or US-6594825-\$ or US-8538675-\$) did.	US-PGUPB; USPAT	OR	ON	2019/05/02 09:09
S70	1	(12/041472).APP.	USPAT; USCCR	OR	ON	2019/05/02 09:11
S71	217	(*20030216837* *20040225649* *20050234595* *20050275525* *20060026972* *20060111818* *5097572* *6067477* *6604023* *6756998* *6792319* *6832120* *6912429* *7056753* *7130719* *7187986* *7349226* *7436292* *7440809* *7460534* *7529646*); PNL OR (*7594209*) UFPN	US-PGUPB; USPAT; USCCR	OR	ON	2019/05/02 09:11
S72	21	(*20030216837* *20040225649* *20050234595* *20050275525* *20060026972* *20060111818* *5097572* *6067477* *6604023* *6756998* *6792319* *6832120* *6912429* *7056753* *7130719*	US-PGUPB; USPAT; USCCR	OR	ON	2019/05/02 09:15

		"71879865" "7343228" "7436282" "7440809" "7480534" "7529646") PIV.				
573	17	889 AND (memory AND processor\$1)	US- FORLE; USPAT; USOCR	OR	ON	2019/05/02 09:56

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
548	0	(monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (PVAC) AND (probability AND active AND user AND content AND video)).CLM.	USPAT	OR	ON	2018/12/20 14:35
550	10358	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/00; F24F2120/14).cpc.	USPAT	OR	ON	2018/12/20 14:36
561	10163	(G05D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/00; F24F2120/14).cpc.	USPAT	OR	ON	2018/12/20 14:55

5/3/2019 2:44:33 PM

C:\Users\aojha\Documents\EAST\Workspaces\16374085.wsp

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 1 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	H2176	12/05/2006	Meyer et al.	
	2	12/805705	06/10/2010	Crabtree	
	3	13/470074	08/30/2012	Steinberg	
	4	13/523697	06/14/2012	Hublou et al.	
	5	13/725447	06/06/2013	Steinberg	
	6	13/729401	12/28/2012	Sloop	
	7	13/852577	03/28/2013	Steinberg et al.	
	8	13/858710	09/05/2013	Steinberg et al.	
	9	13/861189	04/11/2013	Steinberg et al.	
	10	14/082,675 (EFACT.007C1)	11/18/2003	Steinberg et al.	
	11	14/263,762	04/28/2014	Steinberg	
	12	14/285,384	05/22/2014	Steinberg et al.	
	13	14/292,377	05/30/2014	Steinberg	
	14	14/491,554	09/19/2014	Steinberg	
	15	14/527,433	10/29/2014	Steinberg et al.	
	16	14/731,221	06/04/2015	Steinberg et al.	
	17	15/616,719	06/07/2017	Steinberg et al.	
	18	D 646,990	10/18/2011	Rhodes	
	19	D 659,560	05/15/2012	Rhodes	
	20	D 673,467	01/01/2013	Lee et al.	
	21	D 705,095 (EFACT.015DA)	05/20/2014	Steinberg et al.	
	22	4,136,732	01/30/1979	Demaray et al.	
	23	4,270,693	06/02/1981	Hayes	
	24	4,341,345	07/27/1982	Hammer et al.	
	25	4,403,644	09/13/1983	Hebert	
	26	4,451,879	05/29/1984	Welch et al.	
	27	4,475,685	10/09/1984	Grimado et al.	
	28	4,655,279	04/07/1987	Harmon	

Examiner Signature	Date Considered
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***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.194

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 2 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	4,674,027	06/16/1987	Beckey	
	30	4,675,828	06/23/1987	Winston	
	31	4,702,305	10/27/1987	Beckey et al.	
	32	4,702,413	10/27/1987	Beckey et al.	
	33	4,897,798	01/30/1990	Cler	
	34	5,124,502	06/23/1992	Nelson et al.	
	35	5,244,146	09/14/1993	Jefferson et al.	
	36	5,270,952	12/14/1993	Adams et al.	
	37	5,279,458	01/18/1994	Dewolf et al.	
	38	5,297,838	03/15/1994	Juravich	
	39	5,314,004	05/24/1994	Strand et al.	
	40	5,348,078	09/20/1994	Dushane et al.	
	41	5,454,511	10/03/1995	Van Ostrand et al.	
	42	5,462,225	10/31/1995	Massara et al.	
	43	5,544,036	08/06/1996	Brown et al.	
	44	5,555,927	09/17/1996	Shah	
	45	5,572,438	11/05/1996	Ehlers et al.	
	46	5,682,949	11/04/1997	Ratcliffe et al.	
	47	5,706,190	01/06/1998	Russ et al.	
	48	5,717,609	02/10/1998	Packa et al.	
	49	5,725,148	03/10/1998	Hartman	
	50	5,729,474	03/17/1998	Hildebrand et al.	
	51	5,818,347	10/06/1998	Dolan et al.	
	52	5,839,654	11/24/1998	Weber	
	53	5,924,486	07/20/1999	Ehlers et al.	
	54	5,977,964	11/02/1999	Williams et al.	
	55	6,079,626	06/27/2000	Hartman	
	56	6,115,713	09/05/2000	Pascucci et al.	
	57	6,145,751	11/14/2000	Ahmed	

Examiner Signature	Date Considered
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T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.195

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 3 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	58	6,178,362	01/23/2001	Woolard et al.	
	59	6,216,956	04/17/2001	Ehlers et al.	
	60	6,223,544	05/01/2001	Seem	
	61	6,260,765	07/17/2001	Natale et al.	
	62	6,241,156	06/05/2001	Kline et al.	
	63	6,351,693	02/26/2002	Monie	
	64	6,400,956	06/02/2002	Richton	
	65	6,400,996	06/04/2002	Hoffberg et al.	
	66	6,437,692	08/20/2002	Petite et al.	
	67	6,449,534	09/10/2002	Stewart	
	68	6,454,177	09/24/2002	Sasao et al.	
	69	6,478,233	11/12/2002	Shah	
	70	6,480,803	11/12/2002	Pierret et al.	
	71	6,483,906	11/19/2002	Lggulden et al.	
	72	6,536,675	03/25/2003	Pesko et al.	
	73	6,542,076	04/01/2003	Joao	
	74	6,549,130	04/15/2003	Joao	
	75	6,574,537	06/02/2003	Kipersztok et al.	
	76	6,580,950	06/17/2003	Johnson	
	77	6,594,825	07/15/2003	Goldschmidtiki et al.	
	78	6,595,430	07/22/2003	Shah	
	79	6,598,056	07/22/2003	Hull et al.	
	80	6,619,555	09/16/2003	Rosen	
	81	6,622,097	09/16/2003	Hunter	
	82	6,622,115	09/16/2003	Brown et al.	
	83	6,622,925	09/23/2003	Carner et al.	
	84	6,622,926	09/23/2003	Sartain et al.	
	85	6,628,997	09/30/2003	Fox et al.	
	86	6,633,823	10/14/2003	Bartone et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 4 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	87	6,643,567	11/04/2003	Kolk et al.	
	88	6,644,098	11/11/2003	Cardinale et al.	
	89	6,671,586	12/30/2003	Davis et al.	
	90	6,695,218	02/24/2004	Fleckenstein	
	91	6,700,224	03/02/2004	Biskup, Sr.,	
	92	6,726,113	04/27/2004	Guo	
	93	6,731,992	05/04/2004	Ziegler	
	94	6,734,806	05/11/2004	Cratsley	
	95	6,772,052	08/03/2004	Amundsen	
	96	6,785,592	08/31/2004	Smith	
	97	6,785,630	08/31/2004	Kolk	
	98	6,786,421	09/07/2004	Rosen	
	99	6,789,739	09/14/2004	Rosen	
	100	6,845,918	01/25/2005	Rotondo	
	101	6,853,959	02/08/2005	Ikeda et al.	
	102	6,868,293	03/15/2005	Schurr	
	103	6,868,319	03/15/2005	Kipersztok et al.	
	104	6,882,712	04/19/2005	Iggulden et al.	
	105	6,889,908	05/10/2005	Crippen et al.	
	106	6,891,838	05/10/2005	Petite et al.	
	107	6,912,429	06/28/2005	Bilger	
	108	6,981,383	01/03/2006	Shah et al.	
	109	6,991,029	01/31/2006	Orfield et al.	
	110	7,009,493	03/07/2006	Howard	
	111	7,031,880	04/18/2006	Seem et al.	
	112	7,039,532	05/02/2006	Hunter	
	113	7,061,393	06/13/2006	Buckingham et al.	
	114	7,089,088	08/08/2006	Terry et al.	
	115	7,130,719	10/31/2006	Ehlers et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 5 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	116	7,130,832	10/31/2006	Bannai et al.	
	117	7,167,079	01/23/2007	Smyth et al.	
	118	7,187,986	03/06/2007	Johnson et al.	
	119	7,205,892	04/17/2007	Luebke et al.	
	120	7,206,670	04/17/2007	Pimputkar et al.	
	121	7,215,746	05/08/2007	Iggulden et al.	
	122	7,216,015	05/08/2007	Poth Robert J.	
	123	7,231,424	06/11/2007	Bodin et al.	
	124	7,232,075	06/19/2007	Rosen	
	125	7,242,988	07/10/2007	Hoffberg et al.	
	126	7,260,823	08/21/2007	Schlack et al.	
	127	7,356,384	04/08/2008	Gull et al.	
	128	7,476,020	01/13/2009	Zufferey et al.	
	129	7,483,964	01/27/2009	Jackson et al.	
	130	7,590,469	09/15/2009	Grohman	
	131	7,644,869	01/12/2010	Hoglund et al.	
	132	7,702,424	04/20/2010	Cannon et al.	
	133	7,758,729	07/20/2010	DeWhitt	
	134	7,784,704	08/31/2010	Harter	
	135	7,848,900 (EFACT.005A)	12/07/2010	Steinberg et al.	
	136	7,869,904	01/11/2011	Cannon et al.	
	137	7,894,943	02/22/2011	Sloup et al.	
	138	7,908,116 (EFACT.004A)	03/15/2011	Steinberg et al.	
	139	7,908,117 (EFACT.003A)	03/15/2011	Steinberg et al.	
	140	7,983,795	07/19/2011	Josephson et al.	
	141	8,010,237 (EFACT.010A)	08/30/2011	Cheung Leo et al.	
	142	8,019,567 (EFACT.006A)	09/13/2011	Steinberg et al.	
	143	8,090,477 (EFACT.013A)	01/03/2012	Steinberg	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

<p align="center">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 6 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	144	8,131,497 (EFACT.005C1)	03/06/2012	Steinberg et al.	
	145	8,131,506 (EFACT.004C1)	03/06/2012	Steinberg et al.	
	146	8,180,492 (EFACT.011A)	05/15/2012	Steinberg	
	147	8,340,826 (EFACT.013C1)	12/25/2012	Steinberg et al.	
	148	8,412,488 (EFACT.004C2)	04/02/2013	Steinberg et al.	
	149	8,423,322 (EFACT.006C1)	04/16/2013	Steinberg et al.	
	150	8,428,782	04/23/2013	Imes	
	151	8,428,785	04/23/2013	Boucher et al.	
	152	8,457,797	06/04/2013	Imes et al.	
	153	8,498,753 (EFACT.009A)	07/30/2013	Steinberg et al.	
	154	8,556,188 (EFACT.012A)	10/15/2013	Steinberg	
	155	8,596,550 (EFACT.007A)	12/03/2013	Steinberg et al.	
	156	8,712,590 (EFACT.013C2)	04/29/2014	Steinberg	
	157	8,738,327 (EFACT.004C3)	05/27/2014	Steinberg et al.	
	158	8,740,100 (EFACT.008A)	06/03/2014	Steinberg	
	159	8,751,186 (EFACT.005C3)	06/10/2014	Steinberg et al.	
	160	8,840,033 (EFACT.012C1)	09/23/2014	Steinberg	
	161	8,850,348	09/30/2014	Fadell et al.	
	162	8,886,488 (EFACT.005C2)	11/11/2014	Steinberg et al.	
	163	9,057,649 (EFACT.006C2)	06/16/2015	Steinberg et al.	
	164	9,134,710 (EFACT.010C1)	09/15/2015	Cheung et al.	
	165	9,194,597 (EFACT.007C1)	11/24/2015	Steinberg et al.	
	166	9,244,470 (EFACT.011C1)	01/26/2016	Steinberg	
	167	9,279,594 (EFACT.008C1)	03/08/2016	Steinberg	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 7 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	168	9,353,965	05/31/2016	Goyal et al.	
	169	9,534,805	01/03/2017	Matsuoka et al.	
	170	9,709,292 (EFACT.012C2)	07/18/2017	Steinberg	
	171	9,791,839	10/17/2017	Matsuoka et al.	
	172	9,939,333 (EFACT.006C3)	04/10/2018	Steinberg et al.	
	173	9,982,905 (EFACT.008C2)	05/29/2018	Steinberg	
	174	10,018,371 (EFACT.007C2)	07/10/2018	Steinberg et al.	
	175	10,048,706 (EFACT.014A)	08/14/2018	Hublou et al.	
	176	2001/0025349	09/27/2001	Sharood et al.	
	177	2003/0040934	02/27/2003	Skidmore et al.	
	178	2004/0065095	04/08/2004	Osborne et al.	
	179	2004/0117330	06/17/2004	Ehlers et al.	
	180	2004/0133314	07/08/2004	Ehlers et al.	
	181	2004/0176880	09/09/2004	Obradovich et al.	
	182	2005/0222889	10/06/2005	Lai et al.	
	183	2005/0288822	12/29/2005	Rayburn	
	184	2006/0045105	03/02/2006	Dobosz et al.	
	185	2006/0214014	09/28/2006	Bash et al.	
	186	2006/0283965	12/21/2006	Mueller et al.	
	187	2007/0043477	02/22/2007	Elhers et al.	
	188	2007/0045431	03/03/2007	Chapman et al.	
	189	2007/0146126	06/28/2007	Wang	
	190	2007/0107450	05/17/2007	Sasao et al.	
	191	2008/0083234	04/10/2008	Krebs et al.	
	192	2008/0083834	04/10/2008	Krebs et al.	
	193	2008/0198549	08/21/2008	Rasmussen et al.	
	194	2008/0281472	11/13/2008	Podgorny et al.	
	195	2009/0005070	01/01/2009	Forstall et al.	

Examiner Signature	Date Considered
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***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.200

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 8 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	196	2009/0018673	01/15/2009	Dushane et al.	
	197	2009/0052859	02/26/2009	Greenberger et al.	
	198	2009/0057426	03/05/2009	Sullivan et al.	
	199	2009/0062970	03/05/2009	Forbes et al.	
	200	2009/0065596	03/12/2009	Seem et al.	
	201	2009/0099699	04/16/2009	Steinberg et al.	
	202	2009/0125151	05/14/2009	Steinberg et al.	
	203	2009/0188985	07/30/2009	Scharing et al.	
	204	2009/0240381	09/24/2009	Lane	
	205	2009/0271013	10/29/2009	Chen	
	206	2009/0281667	11/12/2009	Masui et al.	
	207	2010/0019052	01/28/2010	Yip	
	208	2010/0070086	03/18/2010	Harrod et al.	
	209	2010/0070089	03/18/2010	Harrod et al.	
	210	2010/0070093	03/18/2010	Harrod et al.	
	211	2010/0070234	03/18/2010	Steinberg et al.	
	212	2010/0156608	06/24/2010	BAE et al.	
	213	2010/0162285	06/24/2010	Cohen et al.	
	214	2010/0211224	08/19/2010	Keeling et al.	
	215	2010/0235004	09/16/2010	Thind	
	216	2010/0289643	11/18/2010	Trundle et al.	
	217	2010/0318227	12/16/2010	Steinberg et al.	
	218	2011/0031323	02/10/2011	Nold et al.	
	219	2011/0046792	02/24/2011	Imes et al.	
	220	2011/0046798	02/24/2011	Imes et al.	
	221	2011/0046799	02/24/2011	Imes et al.	
	222	2011/0046800	02/24/2011	Imes et al.	
	223	2011/0046801	02/24/2011	Imes et al.	
	224	2011/0051823	03/03/2011	Imes et al.	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.201

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 9 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	225	2011/0054699	03/03/2011	Imes et al.	
	226	2011/0054710	03/03/2011	Imes et al.	
	227	2011/0118857	05/19/2011	Bodnar	
	228	2011/0173542	07/14/2011	Imes et al.	
	229	2011/0202185	08/18/2011	Imes et al.	
	230	2011/0214060	09/01/2011	Imes et al.	
	231	2011/0224838	09/15/2011	Imes et al.	
	232	2011/0246898	10/06/2011	Imes et al.	
	233	2011/0253796	10/20/2011	Posa et al.	
	234	2011/0290893	12/01/2011	Steinberg	
	235	2011/0307101	12/15/2011	Imes et al.	
	236	2012/0023225	01/26/2012	Imes et al.	
	237	2012/0046859	02/23/2012	Imes et al.	
	238	2012/0064923	03/15/2012	Imes et al.	
	239	2012/0065935	03/15/2012	Steinberg et al.	
	240	2012/0066168	03/15/2012	Fadell et al.	
	241	2012/0072033	03/22/2012	Imes et al.	
	242	2012/0086562	04/12/2012	Steinberg	
	243	2012/0093141	04/19/2012	Imes et al.	
	244	2012/0101637	04/26/2012	Imes et al.	
	245	2012/0135759	05/31/2012	Imes et al.	
	246	2012/0186774	07/26/2012	Matsuoka et al.	
	247	2012/0215725	08/23/2012	Imes et al.	
	248	2012/0221718	08/30/2012	Imes et al.	
	249	2012/0252430	10/04/2012	Imes et al.	
	250	2012/0324119	12/20/2012	Imes et al.	
	251	2013/0053054	02/28/2013	Lovitt et al.	
	252	2013/0054758	02/28/2013	Imes et al.	
	253	2013/0054863	02/28/2013	Imes et al.	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.202

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 10 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	254	2013/0060387	03/07/2013	Imes et al.	
	255	2013/0073094	03/21/2013	Knapton et al.	
	256	2013/0144453	06/06/2013	Subbloie	
	257	2013/0167035	06/27/2013	Imes et al.	
	258	2013/0173064	07/04/2013	Fadell et al.	
	259	2013/0178985	07/11/2013	Lombard et al.	
	260	2013/0226502 EFACT.006C2	08/29/2013	Steinberg et al.	
	261	2013/0310989 (EFACT.009C1)	11/21/2013	Steinberg et al.	
	262	2014/0039690 (EFACT.012C1)	02/06/2014	Steinberg	
	263	2014/0058567	02/27/2014	Matsuoka et al.	
	264	2014/0074300	03/13/2014	Shilts et al.	
	265	2014/0207292	07/24/2014	Ramagem	
	266	2014/0229018 (EFACT.013C3)	08/20/2014	Steinberg	
	267	2014/0316581	10/26/2014	Fadell et al.	
	268	2015/0025691	01/22/2015	Fadell et al.	
	269	2015/0043615 (EFACT.004C4)	02/12/2015	Steinberg et al.	
	270	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
	271	2015/0142180	05/21/2015	Matsuoka et al.	
	272	2015/0227846	08/13/2015	Mercer et al.	
	273	2015/0300892	10/22/2015	Malhotra et al.	
	274	2015/0378373	12/31/2015	Sprinkle et al.	
	275	2016/0047565	02/18/2016	Robinson	
	276	2016/0061474 (EFACT.010C2)	03/03/2016	Cheung et al.	
	277	2016/0097557 (EFACT.013C4)	04/07/2016	Steinberg	
	278	2016/0138822 (EFACT.011C2)	05/19/2016	Steinberg	
	279	2016/0241538	08/18/2016	Khurana et al.	
	280	2016/0290672	10/06/2016	Arensmeier	

Examiner Signature	Date Considered
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***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.203

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 11 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	281	2016/0363337	12/15/2016	Steinberg et al.	
	282	2017/0123391	05/04/2017	Sinha et al.	
	283	2017/0234562	08/17/2017	Ribbich et al.	
	284	2017/0241662	08/24/2017	Steinberg et al.	
	285	2017/0268797	09/21/2017	Mowris et al.	
	286	2017/0322530	11/09/2017	Al-Mohssen et al.	
	287	2017/0328777	11/16/2017	Zeckendorf et al.	
	288	2017/0336090	11/23/2017	Steinberg	
	289	2018/0058711	03/01/2018	Taplin	
	290	2018/0087793	03/29/2018	Okita et al.	
	291	2018/0087795	03/29/2018	Okita et al.	
	292	2018/0216841	08/02/2018	Steinberg	
	293	2018/0245810	08/30/2018	Berka et al.	
	294	2018/0259400	09/13/2018	Steinberg et al.	
	295	2018/0313567	11/01/2018	Steinberg	
	296	2018/0321093	11/08/2018	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	297	EP 0415747 A2	03/06/1991	Shaw et al.		
	298	EP 1102500 A2	05/23/2001	Lucent Technologies Inc.		
	299	EP 2372263 A2	05/10/2011	Mitsubishi Electric Corporation		
	300	GB 2408592 A	06/01/2005	Oswald		
	301	JP 05-189659	07/30/1993	Hitachi Bill Shisetsu Eng. KK.		
	302	JP 2010-038377	02/18/2010	Mitsubishi Heavy Ind. Ltd.		
	303	JP 2010-286218	12/24/2010	Mitsubishi Heavy Ind. Ltd.		
	304	KR 10-1994-0011902	06/22/1994	Koryo Digital Elect. Co.		

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.204

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 12 OF 14	Attorney Docket No.	EFACT.011C3

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	305	KR 10-1999-0070368	09/15/1999	Samsung Electronics Co. Ltd.		
	306	KR 10-2000-0059532	10/05/2000	Dang Hae System Co.		
	307	WO 2005/098331 A1	10/20/2005	Zip Ind Aust Pty Ltd.		
	308	WO 2009/036764 A2	03/26/2009	Danfoss A/S		
	309	WO 2011/100427 A2	08/18/2011	Enphase Energy, Inc.		
	310	WO 2011/011404 A1	01/27/2011	Allure Energy, Inc.		
	311	WO 2011/149600 (EFACT.012WO)	12/01/2011	EcoFactor, Inc.		
	312	WO 2012/024534 (EFACT.013WO)	02/23/2012	EcoFactor, Inc.		
	313	WO 2013/187996	12/19/2013	EcoFactor, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	314	Anonymous: "Process Control", Garfixia Software Architectures, August 31, 2008, Retrieved from the Internet: URL: http://www.dossier-andreas.nevsoftwarearchitecture/process_control.html pages 1-1.	
	315	ARENS, et al., "How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings", 2005, research paper, Center for the Built Environment, Controls and Information Technology.	
	316	BOURHAN, et al., "Cynamic model of an HVAC system for control analysis", Elsevier 2004.	
	317	BRUSH, et al., Preheat - Controlling Home Heating with Occupancy Prediction, 2013.	
	318	CHENG et al., "Smart Sensors Enable Smart Air Conditioning Control", Sensors 2014, ISSN 1424-8220, June 24, 2014, 25 pages.	
	319	Comverge SuperStat Flyer, prior to June 28, 2007.	
	320	Control4 Wireless Thermostat Brochure, 2006.	
	321	Cooper Power Systems Web Page, 2000-2009.	
	322	Emerson Climate Technologies, "Network Thermostat for E2 Building Controller Installation and Operation Manual", 2007.	
	323	Enernoc Web Page, 2004-2009.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.205

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 13 OF 14	Attorney Docket No.	EFACT.011C3

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	324	Enerwise Website, 1999-2009.	
	325	GUPTA, et al., Adding GPS-Control to Traditional Thermostats: An xploration of Potential Energy Savings and Design Challenges, House_n, Massachusetts Institute of Technology, pp. 95-114, 2009.	
	326	GUNES et al., "Improving Energy Efficiency and Thermal Comfort of Smart Buildings with HVAC Systems in the Presence of Sensor Faults", IEEE, August 24-26, 2015, 6 pages.	
	327	GUPTA, et al., A Persuasive GPS-Controlled Thermostat System, MIT, 2008.	
	328	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome, 2004.	
	329	Honeywell, "W7600/W7620 Controller Reference Manual, HW0021207, October, 1992.	
	330	JOHNSON CONTROLS, "T600HCx-3 Single-Stage Thermostats", 2006.	
	331	JOHNSON CONTROLS, Touch4 building automation system brochure, 2007.	
	332	KILICOTTE, et al., "Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York", Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA, August 13-18, 2006	
	333	KRUMM, et al., Learning Time-Based Presence Probabilities, June 2011.	
	334	LIN, et al., "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002.	
	335	PIER, Southern California Edison, Demand Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report, February 14, 2006.	
	336	Proliphix Thermostat Brochure, prior to June 2007.	
	337	RAJI, "Smart Networks for Control", IEEE Spectrum, June 1994.	
	338	SCOTT, et al., Home Heating Using GPS-Based Arrival Prediction, 2010.	
	339	SIMMINI et al., Energy Efficient Control and Fault Detection for HVAC Systems, Univ. of Padova, XXVI Series, 2014, 144 pages.	
	340	SKLAVOUNOS, "Detection of Abnormal Situations and Energy Efficiency Control in Heating Ventilation and Air Conditioning (HVAC) Systems", Brunel University thesis, September 2015, 151 pages.	
	341	WANG, et al., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings," (2003), Center for Environmental Design Research.	
	342	WETTER, et al., A comparison of deterministic and probabilistic optimization algorithms for non-smooth simulation-based optimization, Building and Environment 39, 2004, Pages 989-999.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./~~ B.206

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 14 OF 14	Attorney Docket No.	EFACT.011C3

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	343	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO).	
	344	Office Action in Canadian Application No. 2800491 dated December 7, 2016 (EFACT.012CA).	
	345	Search Report in European Application No. 11787067.5 dated August 14, 2017 (EFACT.012EP).	
	346	Extended Search Report for European Application No. 11818805.1 dated June 9, 2017 (EFACT.013EP).	
	347	Search Report in European Application No. 11818805.1 dated October 11, 2018 (EFACT.013EP).	
	348	International Search Report and Written Opinion for PCT/US2013/035726 (EFACT.014WO), dated 08/06/2013.	
	349	International Preliminary Report on Patentability in PCT/US2013/035726 dated 12/16/2014 (EFACT.014WO).	
	350	Extended Search Report for European Application No. 13804057.1 dated June 1, 2016 (EFACT.014EP).	
	351	Examination Report in Australian Application No. 2013274827 dated April 11, 2017 (EFACT.014AU).	
	352	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO).	

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Examiner Signature /AJAY OJHA/	Date Considered 05/01/2019
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.~~ /A.O./ B.207



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/374,085	04/03/2019	John Douglas Steinberg	EFACT,011C3	6894
20995	7590	04/19/2019	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			ART UNIT	
			PAPER NUMBER	
			2824	
			NOTIFICATION DATE	
			DELIVERY MODE	
			04/19/2019	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com
 jayna.cartee@knobbe.com

<i>Decision Granting Request for Prioritized Examination (Track I)</i>	Application No. 16/374,885	Applicant(s) Steinberg, John Douglas	
	Examiner BRIAN W BROWN	Art Unit OPET	AIA (First Inventor to File) Status No

1. THE REQUEST FILED 03 April 2019 IS **GRANTED**.

The above-identified application has met the requirements for prioritized examination:

A. ☒ for an original nonprovisional application (Track I).

B. ☐ for an application undergoing continued examination (RCE).

2. The above-identified application will undergo prioritized examination. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a petition for extension of time to extend the time period for filing a reply;

B. filing an amendment to amend the application to contain more than four independent claims, more than thirty total claims, or a multiple dependent claim;

C. filing a request for continued examination;

D. filing a notice of appeal;

E. filing a request for suspension of action;

F. mailing of a notice of allowance;

G. mailing of a final Office action;

H. completion of examination as defined in 37 CFR 41.102; or

I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to BRIAN BROWN at (571)272-5338. In his/her absence, calls may be directed to Petitioner Help Desk at (571) 272-3282.

/BRIAN W BROWN/ Petitions Examiner, OPET	
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UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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 P.O. Box 1350
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FILITE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/374,085	04/03/2019	3763	785	IEFACT011C3	20	2

CONFIRMATION NO. 6894

FILING RECEIPT



00000000107477103

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 04/18/2019

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

John Douglas Steinberg, Millbrae, CA;

Applicant(s)

EcoFactor, Inc., Redwood City, CA;

Power of Attorney: The patent practitioners associated with Customer Number 20995

Domestic Priority data as claimed by applicant

This application is a CON of 15/002,791 01/21/2016
 which is a CON of 13/470,074 05/11/2012 PAT 9244470
 which is a CON of 12/502,064 07/13/2009 PAT 8180492
 which claims benefit of 61/134,714 07/14/2008

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/17/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/374,085**

Projected Publication Date: 07/25/2019

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Preliminary Class

236

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-873						Application or Docket Number 18/074,085			
APPLICATION AS FILED - PART I									
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASE FEE (37 CFR 1.101(a)-(c), (d)-(e))	N/A	N/A	N/A	75		N/A			
SEARCH FEE (37 CFR 1.102(a)-(c), (d)-(e))	N/A	N/A	N/A	930		N/A			
EXAMINATION FEE (37 CFR 1.102(a)-(c), (d)-(e))	N/A	N/A	N/A	390		N/A			
TOTAL CLAIMS (37 CFR 1.101)	20	minus 10 *	x	50	0.00				
INDEPENDENT CLAIMS (37 CFR 1.101)	2	minus 1 *	x	230	0.00				
APPLICATION SIZE FEE (37 CFR 1.101(a))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(C) and 37 CFR 1.101(g).				0.00				
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.102)					0.00				
* If a difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	795	TOTAL			
APPLICATION AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLASS REEXAMINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Topic (37 CFR 1.102)	Topic	"	x	"	x	"	"	
	Independent (37 CFR 1.102)	Topic	"	x	"	x	"	"	
	Application Size Fee (37 CFR 1.101)								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)								
				TOTAL ADD'L FEE		TOTAL ADD'L FEE			
AMENDMENT B	CLASS REEXAMINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Topic (37 CFR 1.102)	Topic	"	x	"	x	"	"	
	Independent (37 CFR 1.102)	Topic	"	x	"	x	"	"	
	Application Size Fee (37 CFR 1.101)								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)								
				TOTAL ADD'L FEE		TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3. ** If the Highest Number Previously Paid For (in THIS SPACE) is less than 20, enter "20". *** If the Highest Number Previously Paid For (in THIS SPACE) is less than 3, enter "3". **** The Highest Number Previously Paid For (of topic or independent) is the highest number in the appropriate box in column 2.									

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Unknown
Filing Date	Herewith
First Named Inventor	John Douglas Steinberg
Title	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Art Unit	Unknown
Examiner Name	Unknown
Attorney Docket Number	EFACT.011C3

SIGNATURE of Applicant or Patent Practitioner

Signature	/John R. King/	Date (Optional)	
Name	John R. King	Registration Number	34,362
Title (if Applicant is a juristic entity)	Attorney of record		
Applicant Name (if Applicant is a juristic entity)	EcoFactor, Inc.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Doc Code: PA

Document Description: Power of Attorney

PTO-AIA/82A (07-13)

Approved for use through 11/30/2014. OMA 06/01/2001

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO-AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO-AIA/82A) or identified above.

20995

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO-AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO-AIA/82A) or identified above. (Note: Complete form PTO-AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

EcoFactor, Inc.



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with the document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

John Douglas Weinberg

Title

EVP of Business Development

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.32(a), 1.32(b), and 1.33. This information is required to determine if you are eligible to file a patent application with the USPTO to prosecute an application. Confidentiality is governed by 35 U.S.C. 133 and 37 CFR 1.11 and 1.14. This collection is intended to take a minimum of 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any questions on the amount of time you require to complete this form under suggestions for reducing the burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

B215

INFORMATION DISCLOSURE STATEMENT

First Inventor	: John Douglas Steinberg
App. No.	: Unknown
Filed	: Herewith
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Unknown
Art Unit	: Unknown
Conf. No.	: Unknown

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Listed references are of record in U.S. Patent Application No. 15/002,791, filed January 21, 2016, which is the parent of this continuation application, and is relied upon for an earlier filing date under 35 USC 120. Copies of the references are not submitted pursuant to 37 CFR 1.98(d).

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed within three months of the filing date and no fee is believed to be required.

Application No.: Unknown
Filing Date: Herewith

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: April 3, 2019

By: John R. King
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

30249523

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 1 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	H2176	12/05/2006	Meyer et al.	
	2	12/805705	06/10/2010	Crabtree	
	3	13/470074	08/30/2012	Steinberg	
	4	13/523697	06/14/2012	Hublou et al.	
	5	13/725447	06/06/2013	Steinberg	
	6	13/729401	12/28/2012	Sloop	
	7	13/852577	03/28/2013	Steinberg et al.	
	8	13/858710	09/05/2013	Steinberg et al.	
	9	13/861189	04/11/2013	Steinberg et al.	
	10	14/082,675 (EFACT.007C1)	11/18/2003	Steinberg et al.	
	11	14/263,762	04/28/2014	Steinberg	
	12	14/285,384	05/22/2014	Steinberg et al.	
	13	14/292,377	05/30/2014	Steinberg	
	14	14/491,554	09/19/2014	Steinberg	
	15	14/527,433	10/29/2014	Steinberg et al.	
	16	14/731,221	06/04/2015	Steinberg et al.	
	17	15/616,719	06/07/2017	Steinberg et al.	
	18	D 646,990	10/18/2011	Rhodes	
	19	D 659,560	05/15/2012	Rhodes	
	20	D 673,467	01/01/2013	Lee et al.	
	21	D 705,095 (EFACT.015DA)	05/20/2014	Steinberg et al.	
	22	4,136,732	01/30/1979	Demaray et al.	
	23	4,270,693	06/02/1981	Hayes	
	24	4,341,345	07/27/1982	Hammer et al.	
	25	4,403,644	09/13/1983	Hebert	
	26	4,451,879	05/29/1984	Welch et al.	
	27	4,475,685	10/09/1984	Grimado et al.	
	28	4,655,279	04/07/1987	Harmon	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.218

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 2 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	4,674,027	06/16/1987	Beckey	
	30	4,675,828	06/23/1987	Winston	
	31	4,702,305	10/27/1987	Beckey et al.	
	32	4,702,413	10/27/1987	Beckey et al.	
	33	4,897,798	01/30/1990	Cler	
	34	5,124,502	06/23/1992	Nelson et al.	
	35	5,244,146	09/14/1993	Jefferson et al.	
	36	5,270,952	12/14/1993	Adams et al.	
	37	5,279,458	01/18/1994	Dewolf et al.	
	38	5,297,838	03/15/1994	Juravich	
	39	5,314,004	05/24/1994	Strand et al.	
	40	5,348,078	09/20/1994	Dushane et al.	
	41	5,454,511	10/03/1995	Van Ostrand et al.	
	42	5,462,225	10/31/1995	Massara et al.	
	43	5,544,036	08/06/1996	Brown et al.	
	44	5,555,927	09/17/1996	Shah	
	45	5,572,438	11/05/1996	Ehlers et al.	
	46	5,682,949	11/04/1997	Ratcliffe et al.	
	47	5,706,190	01/06/1998	Russ et al.	
	48	5,717,609	02/10/1998	Packa et al.	
	49	5,725,148	03/10/1998	Hartman	
	50	5,729,474	03/17/1998	Hildebrand et al.	
	51	5,818,347	10/06/1998	Dolan et al.	
	52	5,839,654	11/24/1998	Weber	
	53	5,924,486	07/20/1999	Ehlers et al.	
	54	5,977,964	11/02/1999	Williams et al.	
	55	6,079,626	06/27/2000	Hartman	
	56	6,115,713	09/05/2000	Pascucci et al.	
	57	6,145,751	11/14/2000	Ahmed	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.219

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 3 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	58	6,178,362	01/23/2001	Woolard et al.	
	59	6,216,956	04/17/2001	Ehlers et al.	
	60	6,223,544	05/01/2001	Seem	
	61	6,260,765	07/17/2001	Natale et al.	
	62	6,241,156	06/05/2001	Kline et al.	
	63	6,351,693	02/26/2002	Monie	
	64	6,400,956	06/02/2002	Richton	
	65	6,400,996	06/04/2002	Hoffberg et al.	
	66	6,437,692	08/20/2002	Petite et al.	
	67	6,449,534	09/10/2002	Stewart	
	68	6,454,177	09/24/2002	Sasao et al.	
	69	6,478,233	11/12/2002	Shah	
	70	6,480,803	11/12/2002	Pierret et al.	
	71	6,483,906	11/19/2002	Lggulden et al.	
	72	6,536,675	03/25/2003	Pesko et al.	
	73	6,542,076	04/01/2003	Joao	
	74	6,549,130	04/15/2003	Joao	
	75	6,574,537	06/02/2003	Kipersztok et al.	
	76	6,580,950	06/17/2003	Johnson	
	77	6,594,825	07/15/2003	Goldschmidtiki et al.	
	78	6,595,430	07/22/2003	Shah	
	79	6,598,056	07/22/2003	Hull et al.	
	80	6,619,555	09/16/2003	Rosen	
	81	6,622,097	09/16/2003	Hunter	
	82	6,622,115	09/16/2003	Brown et al.	
	83	6,622,925	09/23/2003	Carner et al.	
	84	6,622,926	09/23/2003	Sartain et al.	
	85	6,628,997	09/30/2003	Fox et al.	
	86	6,633,823	10/14/2003	Bartone et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.220

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 4 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	87	6,643,567	11/04/2003	Kolk et al.	
	88	6,644,098	11/11/2003	Cardinale et al.	
	89	6,671,586	12/30/2003	Davis et al.	
	90	6,695,218	02/24/2004	Fleckenstein	
	91	6,700,224	03/02/2004	Biskup, Sr.,	
	92	6,726,113	04/27/2004	Guo	
	93	6,731,992	05/04/2004	Ziegler	
	94	6,734,806	05/11/2004	Cratsley	
	95	6,772,052	08/03/2004	Amundsen	
	96	6,785,592	08/31/2004	Smith	
	97	6,785,630	08/31/2004	Kolk	
	98	6,786,421	09/07/2004	Rosen	
	99	6,789,739	09/14/2004	Rosen	
	100	6,845,918	01/25/2005	Rotondo	
	101	6,853,959	02/08/2005	Ikeda et al.	
	102	6,868,293	03/15/2005	Schurr	
	103	6,868,319	03/15/2005	Kipersztok et al.	
	104	6,882,712	04/19/2005	Iggulden et al.	
	105	6,889,908	05/10/2005	Crippen et al.	
	106	6,891,838	05/10/2005	Petite et al.	
	107	6,912,429	06/28/2005	Bilger	
	108	6,981,383	01/03/2006	Shah et al.	
	109	6,991,029	01/31/2006	Orfield et al.	
	110	7,009,493	03/07/2006	Howard	
	111	7,031,880	04/18/2006	Seem et al.	
	112	7,039,532	05/02/2006	Hunter	
	113	7,061,393	06/13/2006	Buckingham et al.	
	114	7,089,088	08/08/2006	Terry et al.	
	115	7,130,719	10/31/2006	Ehlers et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.221

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 5 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	116	7,130,832	10/31/2006	Bannai et al.	
	117	7,167,079	01/23/2007	Smyth et al.	
	118	7,187,986	03/06/2007	Johnson et al.	
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Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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B.222

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 6 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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B.223

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 7 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 8 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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B.225

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	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
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U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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PTO/SB/08 Equivalent

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	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 10 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	256	2013/0144453	06/06/2013	Subbloie	
	257	2013/0167035	06/27/2013	Imes et al.	
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	260	2013/0226502 EFACT.006C2	08/29/2013	Steinberg et al.	
	261	2013/0310989 (EFACT.009C1)	11/21/2013	Steinberg et al.	
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	263	2014/0058567	02/27/2014	Matsuoka et al.	
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	266	2014/0229018 (EFACT.013C3)	08/20/2014	Steinberg	
	267	2014/0316581	10/26/2014	Fadell et al.	
	268	2015/0025691	01/22/2015	Fadell et al.	
	269	2015/0043615 (EFACT.004C4)	02/12/2015	Steinberg et al.	
	270	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
	271	2015/0142180	05/21/2015	Matsuoka et al.	
	272	2015/0227846	08/13/2015	Mercer et al.	
	273	2015/0300892	10/22/2015	Malhotra et al.	
	274	2015/0378373	12/31/2015	Sprinkle et al.	
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	276	2016/0061474 (EFACT.010C2)	03/03/2016	Cheung et al.	
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	279	2016/0241538	08/18/2016	Khurana et al.	
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B.227

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 11 OF 14	Attorney Docket No.	EFACT.011C3

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	281	2016/0363337	12/15/2016	Steinberg et al.	
	282	2017/0123391	05/04/2017	Sinha et al.	
	283	2017/0234562	08/17/2017	Ribbich et al.	
	284	2017/0241662	08/24/2017	Steinberg et al.	
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	287	2017/0328777	11/16/2017	Zeckendorf et al.	
	288	2017/0336090	11/23/2017	Steinberg	
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	293	2018/0245810	08/30/2018	Berka et al.	
	294	2018/0259400	09/13/2018	Steinberg et al.	
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Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
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	301	JP 05-189659	07/30/1993	Hitachi Bill Shisetsu Eng. KK.		
	302	JP 2010-038377	02/18/2010	Mitsubishi Heavy Ind. Ltd.		
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 12 OF 14	Attorney Docket No.	EFACT.011C3

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
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	308	WO 2009/036764 A2	03/26/2009	Danfoss A/S		
	309	WO 2011/100427 A2	08/18/2011	Enphase Energy, Inc.		
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	311	WO 2011/149600 (EFACT.012WO)	12/01/2011	EcoFactor, Inc.		
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NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
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B.229

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 13 OF 14	Attorney Docket No.	EFACT.011C3

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
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	326	GUNES et al., "Improving Energy Efficiency and Thermal Comfort of Smart Buildings with HVAC Systems in the Presence of Sensor Faults", IEEE, August 24-26, 2015, 6 pages.	
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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.230

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 14 OF 14	Attorney Docket No.	EFACT.011C3

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	343	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO).	
	344	Office Action in Canadian Application No. 2800491 dated December 7, 2016 (EFACT.012CA).	
	345	Search Report in European Application No. 11787067.5 dated August 14, 2017 (EFACT.012EP).	
	346	Extended Search Report for European Application No. 11818805.1 dated June 9, 2017 (EFACT.013EP).	
	347	Search Report in European Application No. 11818805.1 dated October 11, 2018 (EFACT.013EP).	
	348	International Search Report and Written Opinion for PCT/US2013/035726 (EFACT.014WO), dated 08/06/2013.	
	349	International Preliminary Report on Patentability in PCT/US2013/035726 dated 12/16/2014 (EFACT.014WO).	
	350	Extended Search Report for European Application No. 13804057.1 dated June 1, 2016 (EFACT.014EP).	
	351	Examination Report in Australian Application No. 2013274827 dated April 11, 2017 (EFACT.014AU).	
	352	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO).	

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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

B.231

Doc Code: TRACK1.REQ

Document Description: TrackOne Request

PTO/AIA/424 (04-14)

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e) (Page 1 of 1)**

First Named Inventor:	John Douglas Steinberg	Nonprovisional Application Number (if known):	EFACT.011C3
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:
 - I. ☒ **Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**
 - i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.
---OR---
 - (b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
 - ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.
 - II. ☐ **Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**
 - i. A request for continued examination has been filed with, or prior to, this form.
 - ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
 - iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
 - iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
 - v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature <u>/John R. King/</u>	Date <u>April 3, 2019</u>
Name (Print/Typed) <u>John R. King</u>	Practitioner Registration Number <u>34,362</u>

Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*

☒ *Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C3			
Filed as Small Entity				
Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2855

Electronic Acknowledgement Receipt

EFS ID:	35615338
Application Number:	16374085
International Application Number:	
Confirmation Number:	6894
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Sandra Autry
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C3
Receipt Date:	03-APR-2019
Filing Date:	
Time Stamp:	14:47:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2855
RAM confirmation Number	040419INTEFSW14491600
Deposit Account	111410
Authorized User	Sandra Autry

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

B.236

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	EFACT-011C3_ADS.pdf	1256373	no	8
			[4a42664600d73499cc13c6d5724081127f] cc17		

Warnings:**Information:**

2		EFACT-011C3_specification.pdf	79037	yes	17
			db9658c4221c5a755c76c13c431c1c75ec4 8a46a		

Multipart Description/PDF files in .zip description

	Document Description	Start	End
	Specification	1	12
	Claims	13	16
	Abstract	17	17

Warnings:**Information:**

3	Drawings-only black and white line drawings	EFACT-011C3_drawings.pdf	154403	no	8
			4678c50903923632990dcba661c12ca28d 96d66		

Warnings:**Information:**

4	Oath or Declaration filed	EFACT-011C3_declaration.pdf	86625	no	1
			3217cc313661c40c621c3c461a8cc154c0b c4777		

Warnings:**Information:**

5	Power of Attorney	EFACT-011C3_POA.pdf	262609	no	2
			c4053c2d621c4c1396f36dc58764cd10ff4 a716		

Warnings:					
Information:					
6		EFACT-011C3_IDS.pdf	138674 69e11fdd4e901c93c7613262c81c0309d385017a	yes	16
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	16	
Warnings:					
Information:					
7	TrackOne Request	EFACT-011C3_trackone.pdf	114102 a2c0d797d200d6a0c07c0f2f19c21a7611196c2	no	2
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	40295 7200a6ce1a726cd68a50950acda70c51d3f1c677	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2132118		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C3
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2. (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	--

Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	John	Douglas	Steinberg			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Millbrae	State/Province	CA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		373 Hacienda Way				
Address 2						
City	Millbrae	State/Province	CA			
Postal Code	94030	Country	US			
All Inventors Must Be Listed - Additional inventor information blocks may be generated within this form by selecting the Add button. Add						

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.			
Customer Number	20995		
Email Address	efiling@knobbe.com		Add Email Remove Email

Application Information:

Title of the Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Attorney Docket Number	EFACT.011C3	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C3
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	20995		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/002791	2016-01-21

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		EFACT.011C3	
		Application Number			
Title of Invention		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			

Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/002791	Continuation of	13/470074	2012-05-11	9244470	2016-01-26

Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13/470074	Continuation of	12/502064	2009-07-13	8180492	2012-05-15

Prior Application Status		Expired		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
12/502064	Claims benefit of provisional	61/134714	2008-07-14		

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)¹ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove			
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

- ☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
- NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C3
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	EEFACT.011023
	Application Number	
Title of Invention SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;">Clear</p>		
<input checked="" type="radio"/> Assignee	<input type="radio"/> Legal Representative under 35 U.S.C. 117	<input type="radio"/> Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor:		
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>		
Organization Name	EcoFactor, Inc.	
Mailing Address Information For Applicant:		
Address 1	1450 Veteran's Boulevard	
Address 2	Suite 100	
City	Redwood City	State/Province CA
Country	US	Postal Code 94063
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EEACT.011023
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Assignee	1
----------	---

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here.

☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Add

Signature:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	EFACT.011C3
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM	

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EFACT.011C3

PATENT

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

RELATED APPLICATIONS

[0001] Any and all applications for which a foreign or domestic priority claim is identified in the Application Data Sheet, or any correction thereto, are hereby incorporated by reference into this application under 37 CFR 1.57.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

[0003] Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

[0004] These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

[0005] Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

[0006] A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals - ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can shift between multiple present temperatures at different times without real-time involvement of a human being.

[0007] Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at +/- 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

[0008] As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint - that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

[0009] In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by those systems. Hotel guests often turn the air conditioner to a low temperature setting and then leave the room for hours at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system. Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor

detects motion (which is assumed to coincide with the return of the guest), the HVAC system resets to the guest's chosen setting.

[0010] Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

[0011] It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

SUMMARY OF THE INVENTION

[0012] In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with one or more computers or other

consumer electronic devices which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the thermostats to their HVAC systems. The server also monitors and logs activity on the computers or other consumer electronic devices associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

[0013] At least one embodiment of the invention comprises the steps of determining whether one or more networked electronic devices inside a structure are in use; determining whether said use of said networked electronic devices indicates occupancy of said structure; and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

[0014] At least one embodiment of the invention comprises at least one said thermostat having at least one temperature setting associated with the presence of one or more occupants in said structure, and at least one temperature setting associated with the absence of occupants in said structure; one or more electronic devices having at least a user interface; where said electronic devices and said thermostat are connected to a network; where said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

[0016] Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

[0017] Figure 3 shows an embodiment of the website to be used as part of the subject invention.

[0018] Figure 4 shows a high-level schematic of the thermostat used as part of the subject invention.

[0019] Figure 5 shows one embodiment of the database structure used as part of the subject invention.

[0020] Figure 6 shows the browser as seen on the display of the computer used as part of the subject invention.

[0021] Figure 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

[0022] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] **Figure 1** shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

[0024] Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

[0025] When a user of the subject invention wishes to access information on network 102, the user initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn,

establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

[0026] One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

[0027] The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

[0028] In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

[0029] In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

[0030] Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Computers 104 can also be microprocessor- controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

[0031] Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices. The storage medium may comprise any method of storing information. It may comprise random access

memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data. Computers 104 and 106 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like. Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

[0032] **Figure 2** illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 112 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served as web pages and viewed by computers 104, as well as databases containing information used by the servers.

[0033] In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in **Figure 3**. Those components may include a means to enter temperature settings 202, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

[0034] **Figure 4** shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254,

memory 256, a display 258, a power source 260, a relay 262, which turns the HVAC system on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

[0035] The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

[0036] The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of the home, the solar orientation of the home, the location of the thermostat in the home, the user's preferred temperature settings, whether the user is a participant in a demand reduction program, etc.

[0037] As shown in Figure 3, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow

changing the settings of the temperature for all periods with a single gesture such as a mouse click.

[0038] **Figure 6** represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "No" button 1206. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

[0039] **Figure 7** represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 300 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccupied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under

such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

[0040] **Figure 8** is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system. In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's

programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you. Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

[0041] In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

WHAT IS CLAIMED IS:

1. A system for controlling an HVAC system at a user's building, the system comprising:

a memory; and

one or more processors;

the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of at least one characteristic of the building;

the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building;

the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

the one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is configured to allow the user to adjust temperature setpoints for the HVAC system;

the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the user-specific data, wherein the user-specific information is presented on a website accessible through the Internet;

the one or more processors further configured to determine whether the building is occupied or unoccupied, and based on that determination, to control the HVAC system to provide heating or cooling to the building at an operational temperature.

2. The system of claim 1, wherein the operational temperature is the second temperature setpoint for the building corresponding to a desired temperature

setting when the building is unoccupied, in the event the one or more processors determines that the building is unoccupied.

3. The system of claim 1, wherein the operational temperature is the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, in the event the one or more processors determines that the building is occupied.

4. The system of claim 2, wherein the first data from the at least one sensor comprises a measurement of the current temperature of the building by the sensor.

5. The system of claim 4, wherein the second data from the network connection comprises a measurement of the current outdoor temperature.

6. The system of claim 4, wherein the one or more processors is further configured to query the user to confirm whether to change to a different temperature setpoint after determining whether the building is occupied or unoccupied.

7. The system of claim 5, wherein the one or more processors is further configured to receive at least one setting of the HVAC system.

8. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is currently on or off.

9. The system of claim 7, wherein the at least one setting of the HVAC system comprises whether the HVAC system is operating in a cooling mode or a heating mode.

10. The system of claim 4, wherein the determination of whether the building is occupied or unoccupied by the one or more processors is based on a third data received from a motion sensor.

11. The system of claim 5, wherein the network connection is based on the IEEE 802.11 wireless protocol.

12. The system of claim 5, wherein the memory is further configured to store historical values of the first data and second data.

13. The system of claim 12, wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory.

14. The system of claim 13, wherein the determination of whether the building is occupied or unoccupied by is performed by the first processor.

15. The system of claim 13, wherein the controlling of the HVAC system to provide heating or cooling to the building at an operational temperature is performed by the first processor.

16. The system of claim 5, wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

17. The system of claim 7, wherein the interface is configured to allow the user to turn the HVAC system on or off.

18. The system of claim 7, wherein the interface is configured to allow the user to input that the building is currently unoccupied.

19. A system for controlling an HVAC system at a user's building, the system comprising:

- a memory; and

- one or more processors;

- the one or more processors configured to receive a first data from at least one sensor, wherein the first data from the at least one sensor includes a measurement of the current temperature of the building by the sensor;

- the one or more processors further configured to receive a second data from a network connection, wherein the second data from the network connection is collected from a source external to the building and comprises outdoor temperature;

- the one or more processors further configured to receive a first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied, and a second temperature setpoint for the building corresponding to a desired temperature setting when the building is unoccupied;

- the one or more processors further configured to receive commands through the Internet by way of a remote interface; wherein the interface is

configured to allow the user to adjust temperature setpoints for the HVAC system;

the one or more processors further configured to send user-specific data through the Internet, wherein user-specific information about the building and HVAC system is generated based at least in part on the data, wherein the user-specific information is presented on a website accessible through the Internet;

the one or more processors further configured to receive a third data from a motion sensor, and is further configured to determine whether the building is occupied or unoccupied based at least in part on the third data;

the one or more processors further configured to control the HVAC system based on the determination that the building is occupied to provide heating or cooling to the building effective to reach the first temperature setpoint for the building corresponding to a desired temperature setting when the building is occupied.

20. The system of claim 19, wherein the one or more processors comprises a first processor that is located remotely from the memory and not in electrical contact with the memory, and wherein the first data from the at least one sensor is provided by a sensor that is not electrically connected to the first processor.

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR
AN ENERGY MANAGEMENT SYSTEM

ABSTRACT OF THE DISCLOSURE

The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

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1/8

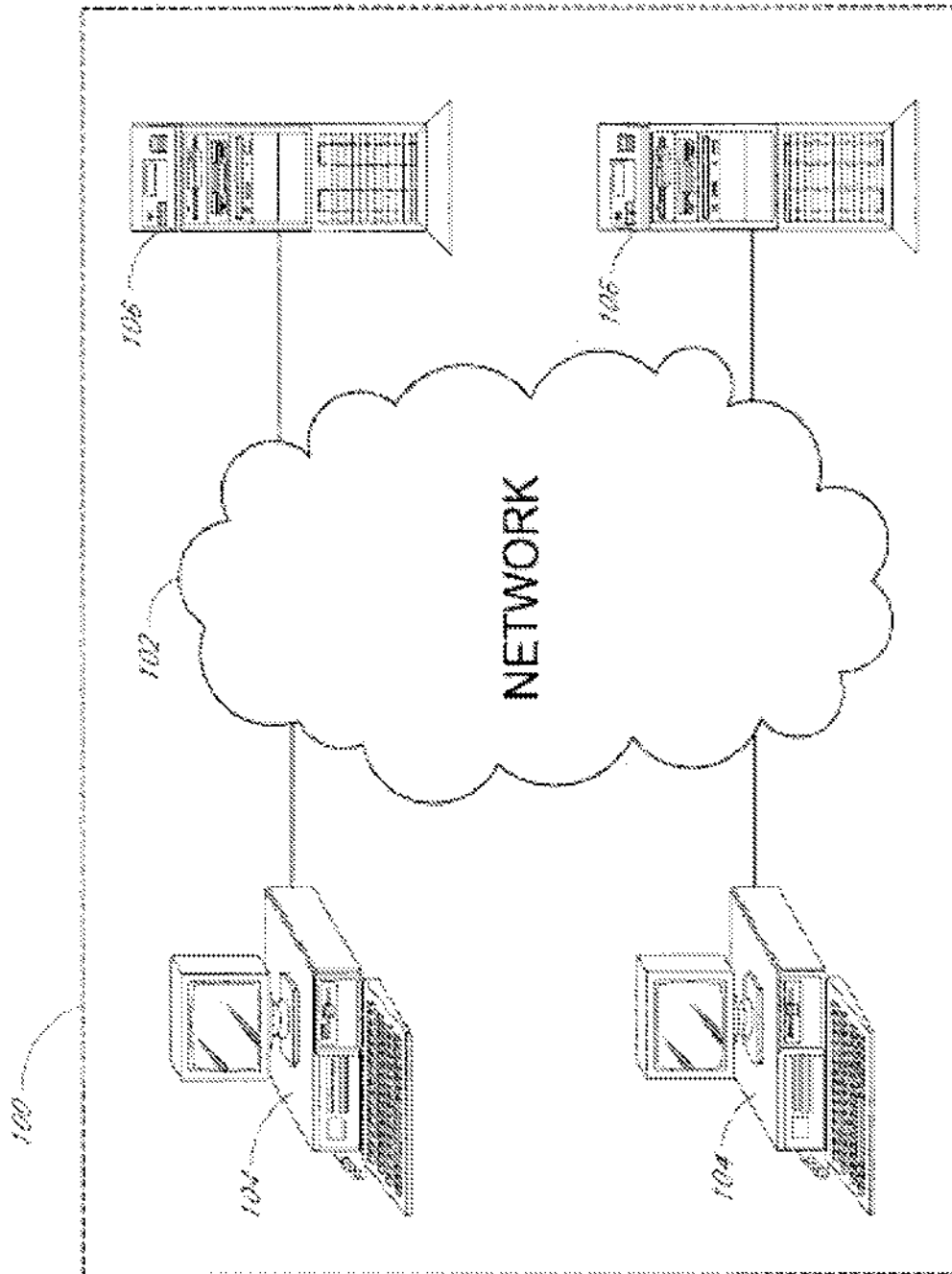
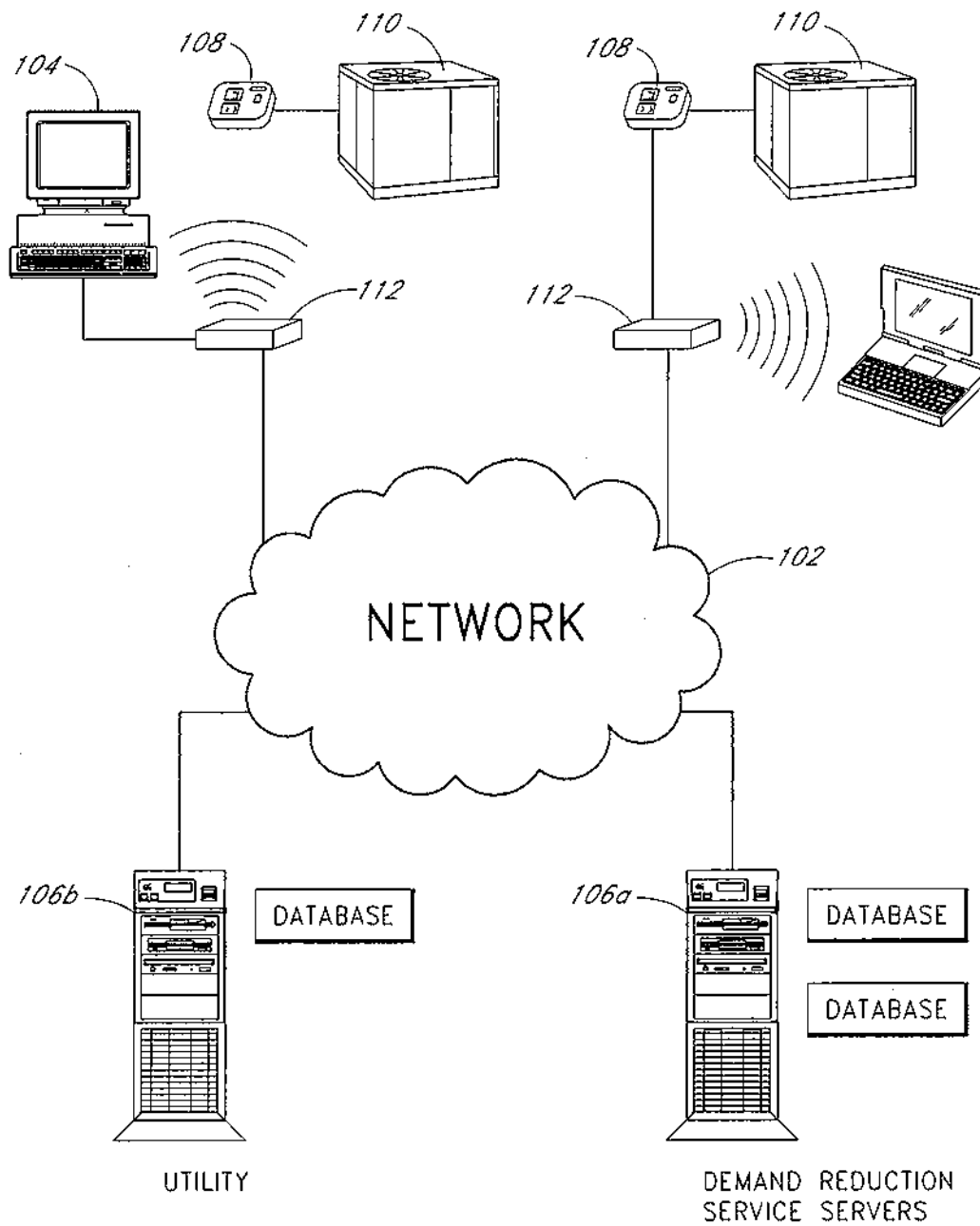


FIG. 1

2/8

*FIG. 2*

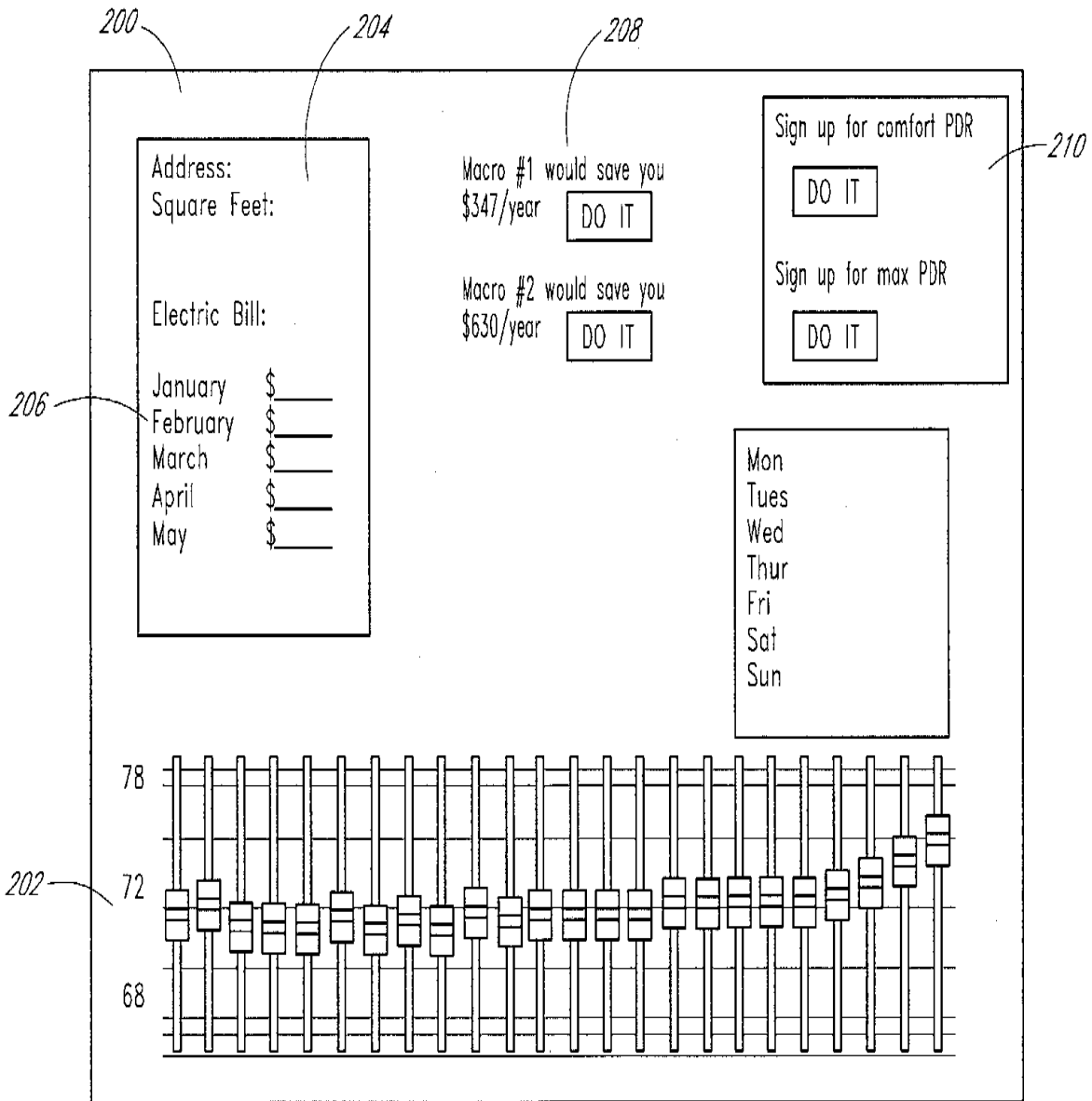


FIG. 3

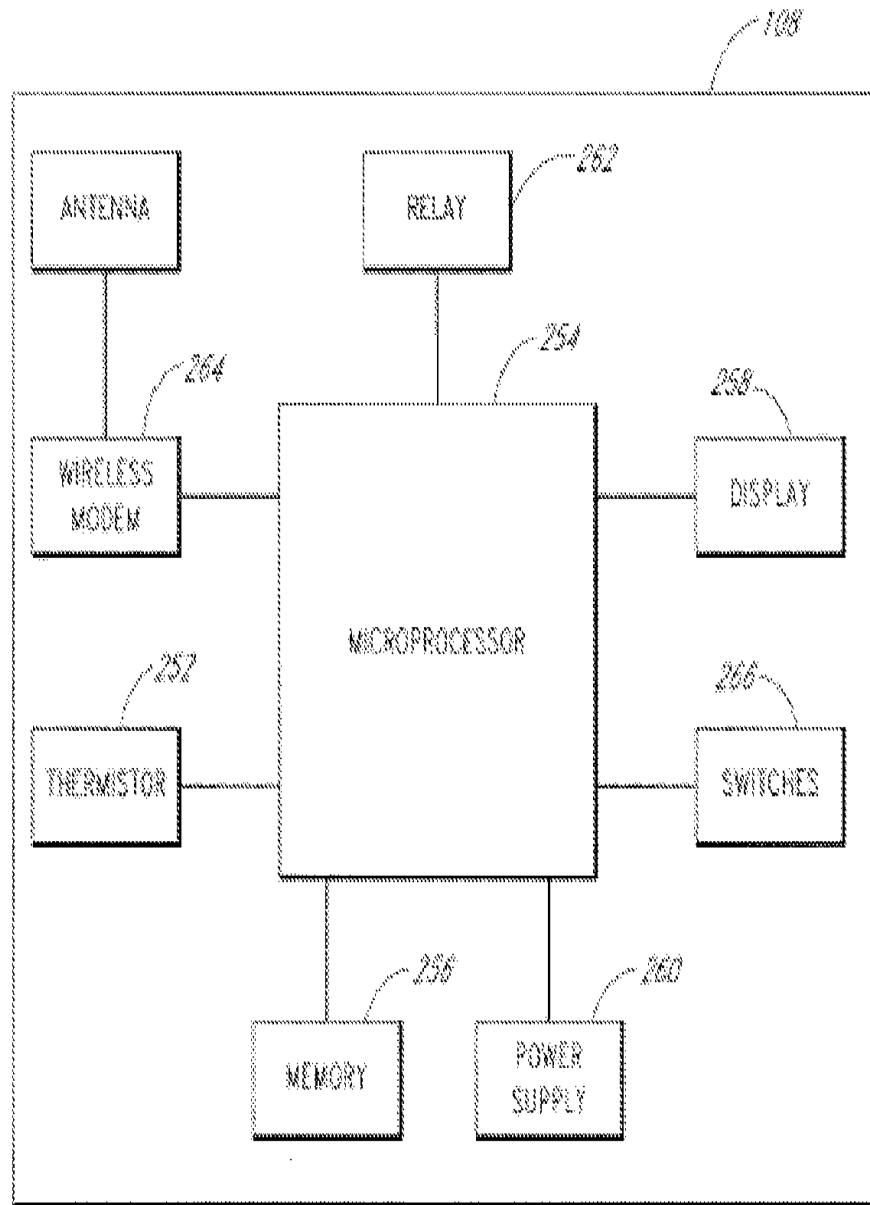


FIG. 4

4/8

5/6

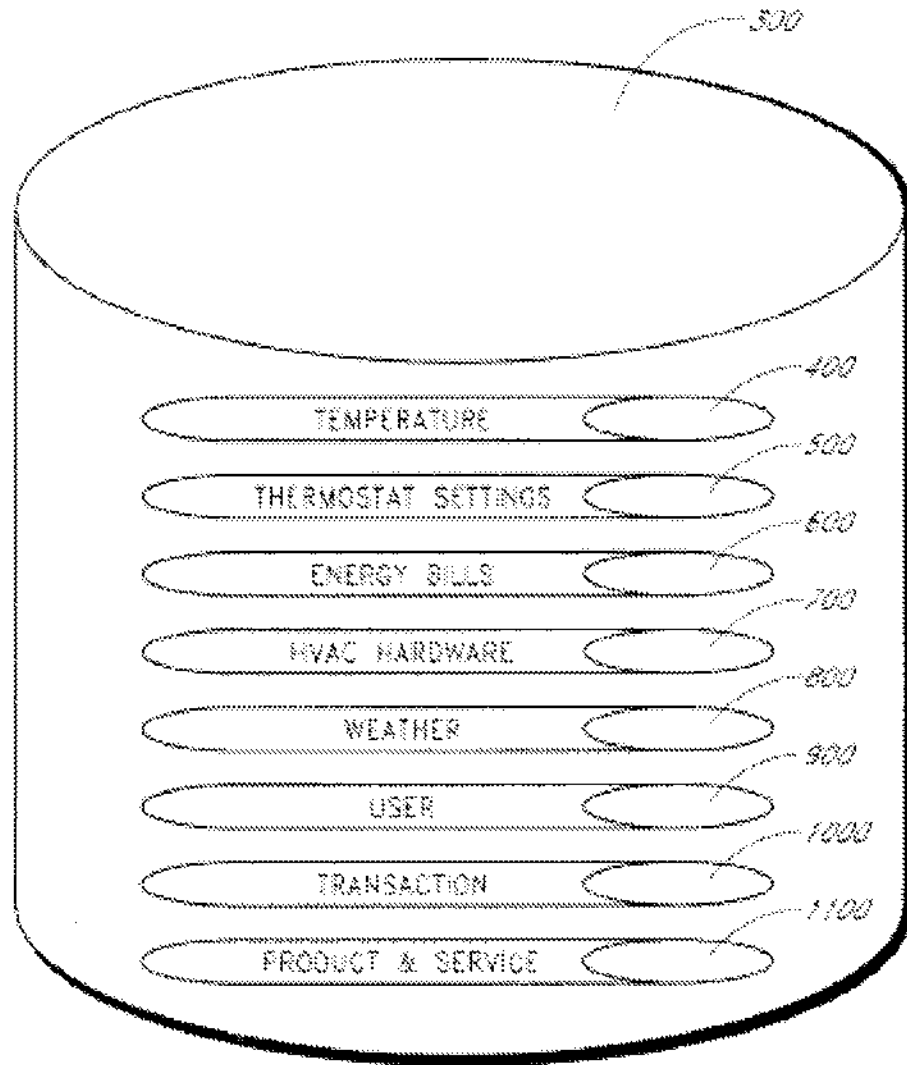
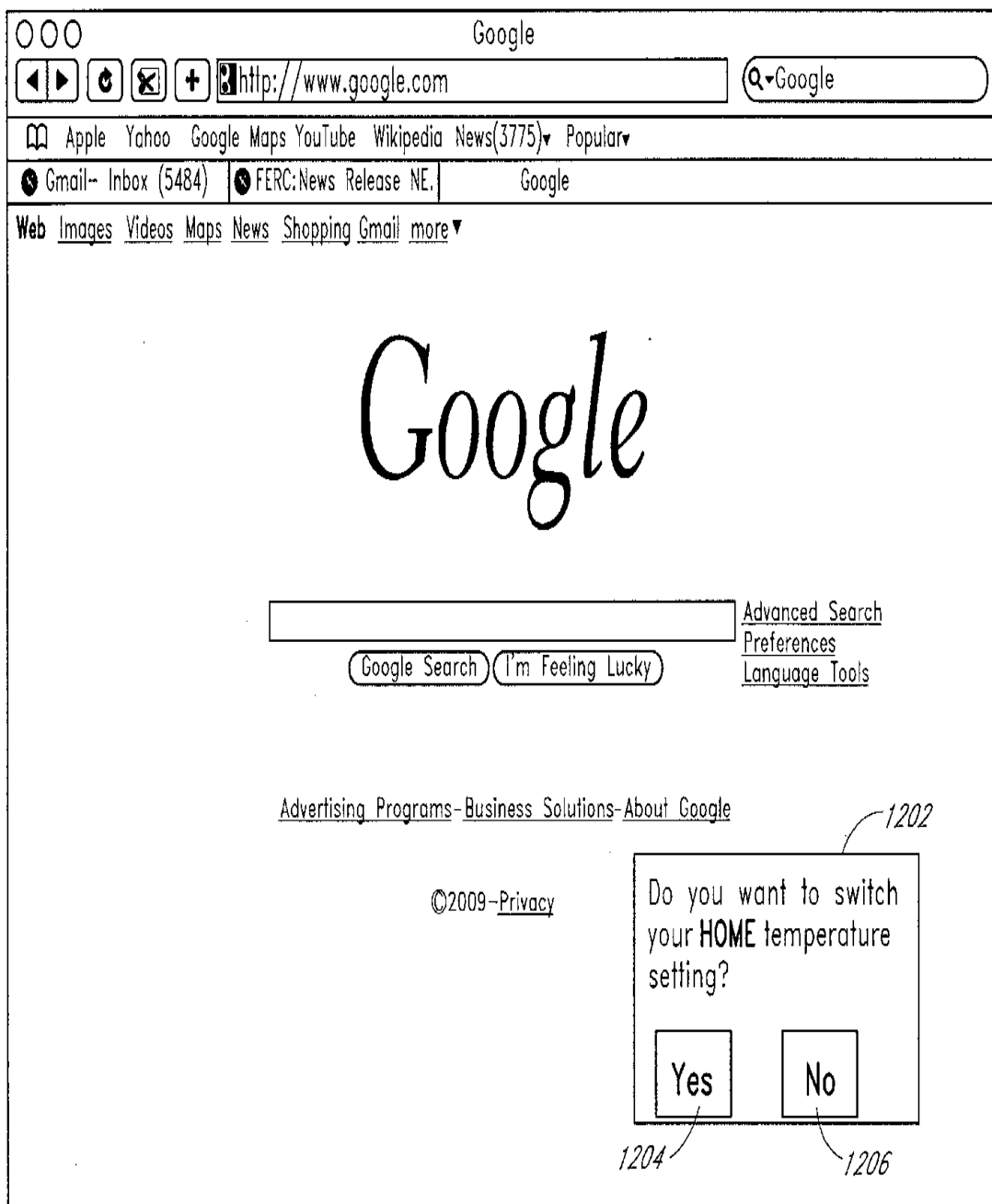


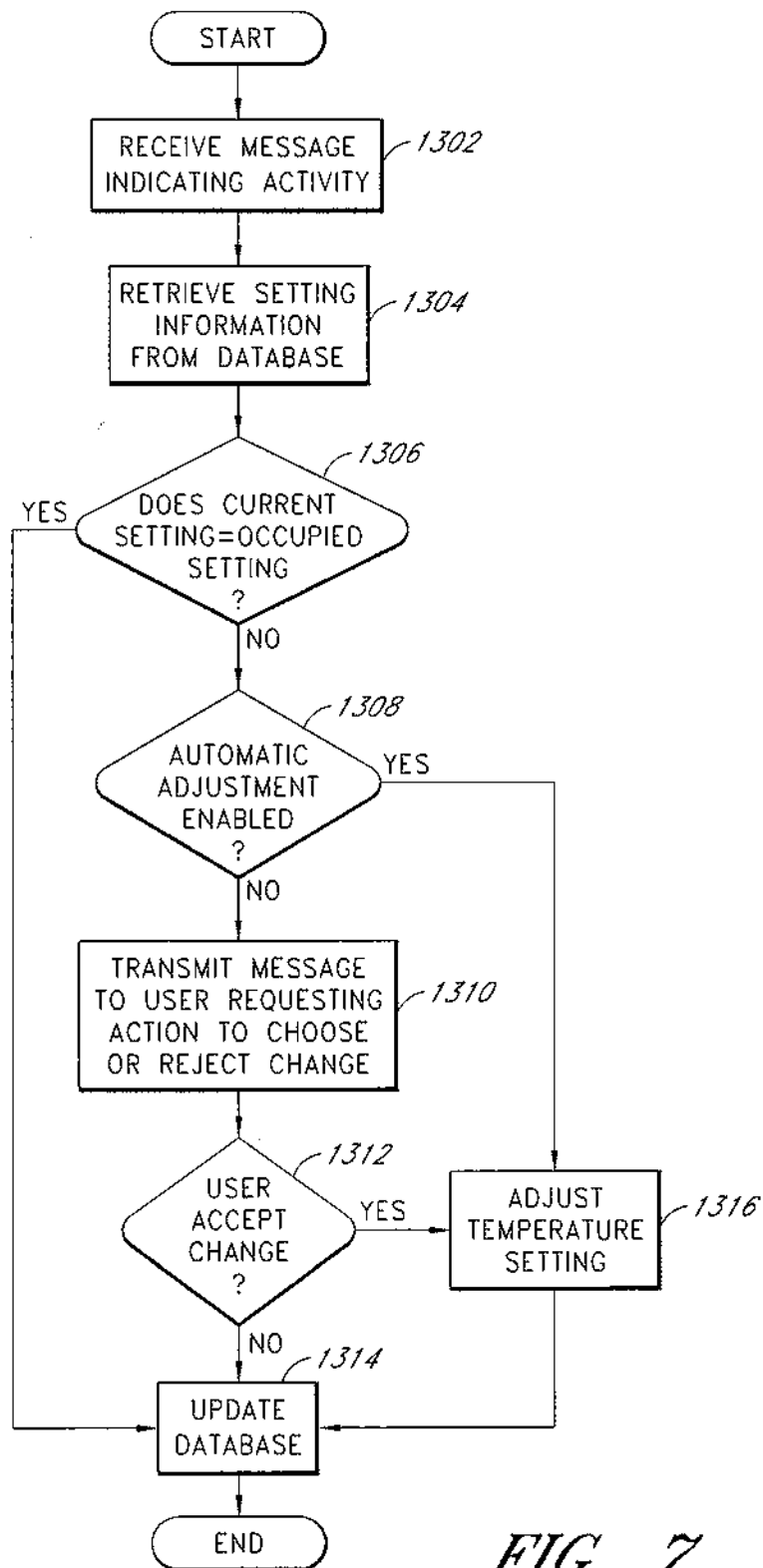
FIG. 5



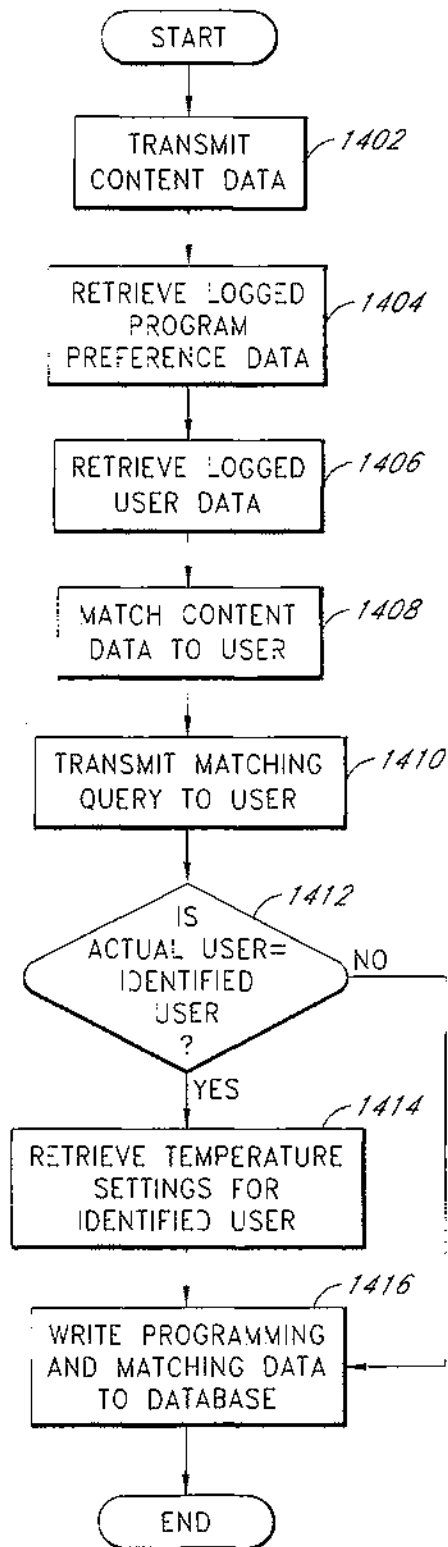
8/8

FIG. 6

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*FIG. 7*

8/8

*FIG. 8*

PTO/AIA/01 (08-12)

Approved for use through 01/31/2014. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
--------------------	---

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number 15/002791 filed on January 21, 2016

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: John Douglas Steinberg Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,391	05/14/2019	R289131	EFACT611C2	4039

20190514 289131 611C2

KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 331 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Ecolactor, Inc., Redwood City, CA;
 John Douglas Steinberg, Millbrae, CA;

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 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,791	01/21/2016	John Douglas Steinberg	EFACT.011C2	4939
7590 04/05/2019 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER OJHA, AJAY	
			ART UNIT	PAPER NUMBER
			2824	
			NOTIFICATION DATE	DELIVERY MODE
			04/05/2019	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 4.2.19 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

- ☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).
- ☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).
- ☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

571-272-4200 or 1-888-786-0101
 Application Assistance Unit
 Office of Data Management

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 1 OF 2	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	9,353,965	05/31/2016	Goyal et al.	
	2	9,534,805	01/03/2017	Matsuoka et al.	
	3	2007/0107450	05/17/2007	Sasao et al.	
	4	2010/0070234	03/18/2010	Steinberg et al.	
	5	2011/0118857	05/19/2011	Bodnar	
	6	2012/0066168	03/15/2012	Fadell et al.	
	7	2014/0074300	03/13/2014	Shilts et al.	
	8	2014/0207292	07/24/2014	Ramagem	
	9	2015/0227846	08/13/2015	Mercer et al.	
	10	2015/0300892	10/22/2015	Malhotra et al.	
	11	2015/0378373	12/31/2015	Sprinkle et al.	
	12	2016/0047565	02/18/2016	Robinson	
	13	2016/0241538	08/18/2016	Khurana et al.	
	14	2016/0290672	10/06/2016	Arensmeier	
	15	2017/0123391	05/04/2017	Sinha et al.	
	16	2017/0234562	08/17/2017	Ribbich et al.	
	17	2017/0268797	09/21/2017	Mowris et al.	
	18	2017/0322530	11/09/2017	Al-Mohssen et al.	
	19	2017/0328777	11/16/2017	Zeckendorf et al.	
	20	2018/0058711	03/01/2018	Taplin	
	21	2018/0245810	08/30/2018	Berka et al.	
	22	2018/0259400	09/13/2018	Steinberg et al.	
	23	2018/0313567	11/01/2018	Steinberg	
	24	2018/0321093	11/08/2018	Steinberg et al.	

NON PATENT LITERATURE DOCUMENTS
--

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 2 OF 2	Attorney Docket No.	EFACT.011C2

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	25	Anonymous: "Process Control", Garfixia Software Architectures, August 31, 2008, Retrieved from the Internet: URL: http://www.dossier-andreas.nevsoftwarearchitecture/process_control.html , pages 1-1.	
	26	Communication in European Application No. 11818805.1 dated October 11, 2018 (EFACT.013EP).	

30247716

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal				
Application Number:		15002791		
Filing Date:		21-Jan-2016		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Amy Durrant		
Attorney Docket Number:		EFACT.011C2		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				500

Electronic Acknowledgement Receipt

EFS ID:	35605185
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Melissa Ramirez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	02-APR-2019
Filing Date:	21-JAN-2016
Time Stamp:	16:07:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$500
RAM confirmation Number	040319INTEFSW16080400
Deposit Account	111410
Authorized User	Melissa Ramirez

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	EFACT-011C2_issuefee.pdf	218219	no	1
			658a2c26ced3c007207c5c30f2d13c7a4963c2c3		

Warnings:**Information:**

2	Miscellaneous Incoming Letter	EFACT-011C2_comments.pdf	16465	no	2
			52ad1fe9d325cc0087f68c4a5d00909c55c00179		

Warnings:**Information:**

3		EFACT-011C2_IDS.pdf	40185	yes	3
			4c0a9d39f20046120f9c62dce9f837d0d7cd0d0d		

Multipart Description/PDF files in .zip description

Document Description		Start	End
Transmittal Letter		1	1
Information Disclosure Statement (IDS) Form (SB08)		2	3

Warnings:**Information:**

4	Non Patent Literature	EFACT-011C2_ref25.pdf	249715	no	2
			3c72fa4d0c9ced7c083a4a26aa3ccdd22554092569		

Warnings:**Information:**

5	Non Patent Literature	EFACT-011C2_ref26.pdf	899813	no	11
			798c022ca23f112753a657f9330573c637a61155		

Warnings:**Information:**

0008

6	Fee Worksheet (SB06)	fee-info.pdf	30308 c23e7c66c4a2a67ef11682ca6346c3aef0 2/37	no	2
---	----------------------	--------------	---	----	---

Warnings:**Information:****Total Files Size (in bytes):**

1454705

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B - FEE TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address on this and unless corrected below or directed otherwise in Block 1, by indicating a new correspondence address and/or by indicating a separate "FEE ADDRESS" for maintenance fee payments.

A COMPLETE CORRESPONDENCE FEE ADDRESS MUST BE USED FOR ALL FEE PAYMENTS.

Note: A certificate of mailing can only be used for domestic mailings of the Patent Transmittal. This certificate cannot be used for any other non-emerging papers. Even additional papers, such as an assignment or formal drawing, must have its own certificate of mailing or transmittal.

202001 17200 04/29/2021
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_____ Signature
_____ Date

APPLICATION NO.	FILED DATE	FIG. NAMED INVENTOR	ATTORNEY (FAX) NO.	CONFIRMATION NO.
65460291	04/21/2021	John Douglas Strubberg	DEAC TELER	4809

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	INVENTOR CODE	PUBLICATION FEE DIS.	PREP. FEE INVENTOR	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	2500	8000	50.00	\$500	04/01/2019

EXAMINER	APPLIC.	CLASS. OF CLASS.
ORLA, AIA	2504	720-276000

1. Change of correspondence address or indication of "FEE ADDRESS" (P. 37 CFR 1.532).

☒ Change of correspondence address (or Change of Correspondence Address form PTO/SB-122) attached.

☐ "FEE ADDRESS" indication (or "FEE ADDRESS" indication form PTO/SB-122). Key (1) of 6 or more must be attached. Use of a Customer Number is required.

2. For printing on the patent front page, list:

(1) The names of up to 3 registered patent attorneys or agents (OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 3 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. **Knobbe, Martens,**2. **Olson & Bear, LLP**

3. _____

3. ASSIGNEE NAME AND RESIDENT DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recording, as set forth in 37 CFR 1.31 and 37 CFR 1.31(h). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE CITY AND STATE OR COUNTRY

EcoFactor, Inc.**Redwood City, CA**Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private entity ☐ Government4a. Fee submitted: ☒ Issue Fee ☐ Publication Fee (if required): ☐ Advance Order - R-1 Copies

4b. Method of Payment: (Please first specify any previously paid fee charges shown)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2010)

☒ The Director is hereby authorized to charge ~~any deficiency~~ any deficiency, or credit any overpayment in Deposit Account No. **11-1410**

* Change in Entity Status (from status indicated above)

☐ Applicant transferring into entity status (see 37 CFR 1.25)

☐ Applicant asserting small entity status (see 37 CFR 1.27)

☐ Applicant changing to regular individual inventor status.

NOTE: Absent a valid certification of Micro Entity Status, any form PTO/SB-122A and 122B, with fee payment in the micro entity amount, will not be accepted at the risk of application abandonment. **NOTE:** If the application was previously under Micro Entity Status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.7 for signature requirements and certifications.

Authorized Signature **John R. King**Date **April 2, 2019**Typed or printed name **John R. King**Registration No. **34,382**

EFACT.011C2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	:	John Douglas Steinberg
App. No.	:	15/002,791
Filed	:	January 21, 2016
For	:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	:	Ajay Ojha
Art Unit	:	2824
Conf. No.	:	4939

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Statement of Reasons for Allowance in the Notice of Allowance mailed January 4, 2019, Applicant respectfully submits the following comments.

Applicant respectfully disagrees with the Examiner's statement of reasons for allowance to the extent that the limitations recited by the Examiner are not present in all of the claims. Also, to the extent that there is any implication that the patentability of the claims rests on the recitation of a single feature, Applicant respectfully disagrees with the Examiner's Statement because it is the combination of features that makes the claims patentable.

Applicant submits that the claims of the present application are allowable because each of the claims recites a combination of features that are not taught or suggested by the prior art.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: April 2, 2019

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

30247574

INFORMATION DISCLOSURE STATEMENT

First Inventor : John Douglas Steinberg
App. No. : 15/002,791
Filed : January 21, 2016
For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS
A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner : Ojha, Ajay
Art Unit : 2824
Conf. No. : 4939

Mail Stop Issue Fee

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Copies of any listed foreign and non-patent literature references are being submitted.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after the mailing date of a final action or after the mailing date of a Notice of Allowance. Please place these references in the file in accordance with 37 CFR 1.97(i).

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: April 2, 2019

By: John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404



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NOTICE OF ALLOWANCE AND FEE(S) DUE

20995 7500 01/04/2019
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IRVINE, CA 92614

EXAMINER

OJHA, AJAY

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 01/04/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,791	01/21/2016	John Douglas Steinberg	EFACT011C2	4939

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	04/04/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEES (Transmittal)

Complete and send this form, together with applicable fees, by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 3 should be completed where appropriate. All further correspondence including the Patent Advances orders and notification of maintenance fees will be mailed to the current correspondence address as indicated below or directed elsewhere in Block 1, by (a) specifying a new correspondence address, and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Use Block 1 for any change of address)

Date: 04/29/2021 From: 04/29/2021

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Note: A certificate of mailing can only be used for domestic mailings of the Patent Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571)-273-2885, on the date below:

_____ (Type or print name)
_____ (Signature)
_____ (Date)

APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY (KEY) NO.	CONFIRMATION NO.
05900291	04/21/2021	John Douglas Scudberg	05ACT0102	0000

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL DUES DUE	DATE DUE
regular initial	SMALL	\$500	\$0.00	\$0.00	\$500	04/30/2021

EXAMINER	ART. 1701	CLASS. NO. CLASS.
ORLA, ALAY	2824	709-276000

1. Change of correspondence address or indication of "The Address" (37 CFR 1.563):

☐ Change of correspondence address (see Change of Correspondence Address form PTO/SB-122) attached.

☐ "The Address" indication (or "End Address" Indication form PTO/SB-47, Key B1-01) or more recent attached. Use of a Customer Number is required.

2. For printing on the patent front page, but:
(1) The names of up to 3 registered patent attorneys or agents (SR, alternatively) 1
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
3. _____

3. ASSIGNEE NAME AND RESIDENT DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recording, as set forth in 37 CFR 1.31 and 37 CFR 1.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE, CITY AND STATE OR COUNTRY

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - Red Copies

4b. Method of Payment: (Please first supply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO 2035)

☐ The Invention is hereby authorized to charge the original fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular individualized fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB-12A and SB-1), non-fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements, and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,791	01/21/2016	John Douglas Steinberg	EPACT011C2	4939
20995	7500	01/04/2019	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			DIHA, AJAY	
2040 MAIN STREET			ART UNIT	
FOURTEENTH FLOOR			PAPER NUMBER	
IRVINE, CA 92614			2824	
DATE MAILED: 01/04/2019				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
 (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability

Application No.

15/002,791

Applicant(s)

Steinberg, John Douglas

Examiner

AJAY QJHA

Art Unit

2824

AIA Status

No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1306.

1. ☒ This communication is responsive to Request for Continued Examination (RCE) - 09/21/2018.

☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-18. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(e)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notices of References Cited (PTO-892)

5. ☐ Examiner's Amendment/Comment

2. ☒ Information Disclosure Statements (PTO/SB-08).

6. ☒ Examiner's Statement of Reasons for Allowance

Paper No./Mail Date 09/21/2018.

3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

7. ☐ Other _____.

4. ☐ Interview Summary (PTO-413).

Paper No./Mail Date _____.

/AJAY QJHA/

Primary Examiner, Art Unit 2824

Application/Control Number: 15/002,791
Art Unit: 2824

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DETAILED ACTION

General Remarks

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.
3. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
4. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
5. Applicants seeking an interview with the examiner, including **WebEx Video Conferencing**, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
6. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 10.
 - b. Amended: 1 and 10.
 - c. Pending: 1-18.

Application/Control Number: 15/002,791
Art Unit: 2824

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IDS

7. Applicant's IDS(s) submitted on 09/21/2018 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has/have considered by the examiner and made of record.

Continued Examination Under 37 CFR 1.114

8. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/21/2018 has been entered.

Response to Arguments

9. Applicant's arguments, see page(s) 6-7, filed 09/21/2018, with respect to claim(s) 1-18 have been fully considered and are persuasive. The rejection of claim(s) 1-18 has been withdrawn.

Allowable Subject Matter

10. **Claim(s) 1-18 are allowed.**

11. The following is an examiner's statement of reasons for allowance:

The closest prior art to the present invention is US 20080281472 A1 ("Podgorny") and US 20090065596 A1 ("Seem").

Podgorny discloses a building automation system, and, more particularly, to an Internet-centric, open, extensible software and hardware framework supporting all aspects of control and monitoring of a smart building ecosphere. The present invention further relates to an "intelligent," real-time control system capable of both autonomous process control and interaction with system users and system administrators, which is configured to accommodate functional extensions and a broad array of sensors and control devices. The system allows individuals to communicate, monitor and adjust their personal

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Art Unit: 2824

environmental preferences (temperature, light, humidity, white noise, etc.) much like they would in an automobile, via the Internet. The system is equipped with an occupancy sensor that recognizes the presence and identity of the individual. A built-in expert system can make decisions based on data from multiple sources so that the system can alter its activity to conserve energy while maintaining users' comfort.

Seem discloses a method for providing control to a building zone uses a building automation system and a portable wireless device located within the building zone. The method includes the step of identifying the portable wireless device using wireless communications. The method further includes retrieving information from a memory device specific to the identified portable wireless device. The retrieved information comprises a user preference relating to the building automation system. The method further includes adjusting a parameter of the building automation system based on the retrieved information.

Re: Independent Claim 1 (and dependent claim(s) 2-9), there is no teaching or suggestion in the prior art of record to provide:

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface that can be used to view video content, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints;

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Page 5

Re: Independent Claim 10 (and dependent claim(s) 11-18), there is no teaching or suggestion in the prior art of record to provide:

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint,

said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints;

Missing elements in the closest art gives rise to the innovation in the current invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Art Unit: 2824

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Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is 571-272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/
Primary Examiner, Art Unit 2824
ajay.ojha@uspto.gov

Search Notes 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	02/13/2018	AO
Refreshed search.	06/11/2018	AO
Refreshed search.	12/20/2018	AO

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

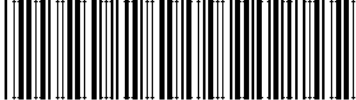
US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.


Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search. See search history.	02/13/2018	AO
Refreshed search. See search history.	06/11/2018	AO
Refreshed search. See search history.	12/20/2018	AO

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
G05D	G05D23/00; G05D23/1902	12/20/2018	AO
F24F	F24F11/006; F24F11/70; F24F11/62; F24F11/30; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	12/20/2018	AO

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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<i>Search Notes</i> 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

/AJAY OJHA/
Primary Examiner, Art Unit 2824

<p><i>Index of Claims</i></p> 	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/002,791	Steinberg, John Douglas
	Examiner	Art Unit
	AJAY GUHA	2824

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected


[illegible]

Issue Classification 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC						
Symbol					Type	Version
G05D	/	23	/	00	F	2013-01-01
G05D	/	23	/	1902	I	2013-01-01
G05B	/	15	/	02	I	2013-01-01
G06N	/	7	/	005	I	2013-01-01
F24F	/	11	/	30	I	2018-01-01
F24F	/	11	/	62	I	2018-01-01
F24F	/	11	/	70	I	2018-01-01
F24F	/	2120	/	10	A	2018-01-01
F24F	/	2120	/	12	A	2018-01-01
F24F	/	2120	/	14	A	2018-01-01
F24F	/	2140	/	60	A	2018-01-01
F24F	/	2120	/	20	A	2018-01-01
F24F	/	11	/	63	A	2018-01-01
F24F	/	11	/	56	A	2018-01-01
F24F	/	11	/	46	A	2018-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version
/				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/AJAY OJHA/ Primary Examiner, Art Unit 2824 (Primary Examiner)	20 December 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2 and 7

Issue Classification 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

INTERNATIONAL CLASSIFICATION			
CLAIMED			
G05D	/	23	/ 00

NON-CLAIMED			
/	/		

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/AJAY OJHA/ Primary Examiner, Art Unit 2824 (Primary Examiner)	20 December 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2 and 7

[illegible]

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
WJAY OJHA/ Primary Examiner, Art Unit 2824	20 December 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2 and 7

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	9,791,839	10/17/2017	Matsuoka et al.	
	2	10,018,371 (EFACT.007C2)	07/10/2018	Steinberg et al.	
	3	10,048,706 (EFACT.014A)	08/14/2018	Hublou et al.	
	4	2018/0216841	08/02/2018	Steinberg	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

29094481

Examiner Signature /AJAY OJHA/	Date Considered 12/20/2018
--------------------------------	----------------------------

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./
T¹ - Place a check mark in this area when an English language Translation is attached.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	815048	(video SAME computer)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 13:58
L4	22410	3 AND (video SAME computer) AND (monitor SAME temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 13:59
L5	14573	3 AND (video SAME computer) AND (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 14:00
L6	884	3 AND (video SAME computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 14:00
L7	653	3 AND (video WITH computer) SAME (monitor WITH temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 14:00
L8	18	3 AND (video WITH computer) SAME (monitor WITH temperature) SAME (user ADI interface)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 14:01
L9	277	(monitor WITH temperature) SAME (user ADI interface) AND (HVAC)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/12/20 14:05
L10	35	(monitor WITH temperature) SAME (user	US-	OR	ON	2018/12/20

		ADU interface SAME (computer laptop)) AND (HVAC)	PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB			14:06
L13	0	((monitor WITH temperature) SAME (user ADU interface SAME (computer laptop)) AND (HVAC) AND (probability AND activi AND user AND content AND video))	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:36
L15	0	(12/181258).APP.	USPAT; USOCR	OR	ON	2018/12/20 14:53
L16	1	(12/041472).APP.	USPAT; USOCR	OR	ON	2018/12/20 14:56
L18	58545	(G05D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/50; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpd.	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/12/20 14:56
S1	149	("STEINBERG") near3 ("JOHN").INV.	US- PGFUB; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	("EcoFactor").AS.AANM.	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/02/07 09:40
S3	46683	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/50; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpd.	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND user\$1 AND wireless).CLM	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/02/07 10:03
S5	16	("9244470")	US- PGFUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	ON	2018/02/07 10:11
S6	9	("9244470")	USPAT	OR	ON	2018/02/07 10:12
S7	25	("20040117330" "20090065596" "20150025691" "6700224"	US- PGFUB;	OR	ON	2018/02/07 10:05

		"20130173064" "20040133314" "5348074" "7868987" "8850348" "9057549" "20140316561" "20150120235" "7236670" "20130178985").PN.	USPAT: USOCR: FPRS: EPO: ISM TDS			
S8	4	"20080281472" "20090065596")	US- PGPUB: USPAT: USOCR: FPRS: EPO: ISM TDS	OR	ON	2018/02/07 18:12
S10	32	US-20010025349-\$ US-20040117330-\$ US-20040133314-\$ US-20080083834-\$ US-20090065070-\$ US-20090018673-\$ US-20090057426-\$ US-20090062970-\$ US-20090271013-\$ US-20130073094-\$ US-20170241662-\$ US-20170336090-\$ US-20180067793-\$ US-20180087795-\$ US-1234567-\$ US-4270683-\$ US- 4702305-\$ US-4702413-\$ US-5207838- \$ US-5454511-\$ US-5706190-\$ US- 5839654-\$ US-6216956-\$ US-6223544- \$ US-6449534-\$ US-6454177-\$ US- 6645916-\$ US-6981383-\$ US-7963795- \$ US-9709292-\$ US-9939333-\$) D/D.	US- PGPUB: USPAT: USOCR: FPRS: EPO: ISM TDS	OR	ON	2018/06/11 18:22
S11	31	"0015616" "20010025349" "20040117330" "20040133314" "20080083834" "20090065070" "20090018673" "20090057426" "20090062970" "20090271013" "20130073094" "20170241662" "20170336090" "20180067793" "20180087795" "4270683" "4702305" "4702413" "5207838" "5454511" "5706190" "5839654" "6216956" "6223544" "6449534" "6454177" "6645916" "6981383" "7963795" "9709292" "9939333").PN.	US- PGPUB: USPAT	OR	ON	2018/06/11 14:20
S12	9	"20160061474" "9244470" "9279594" "20060283065" "20080083234" "20090065596").PN	US- PGPUB: USPAT: USOCR: FPRS: EPO: ISM TDS	OR	ON	2018/06/11 18:03
S13	3	(WC-2009036764-\$) D/D.	US- PGPUB: USPAT: USOCR: FPRS: EPO: ISM TDS	OR	ON	2018/06/11 18:36
S14	0	(desktop ADJ v333 WITH control ADJ3 temperature)	US- PGPUB: USPAT: USOCR: FPRS: EPO: ISM TDS	OR	ON	2018/06/11 18:38
S15	18	(desktop ADJ v333 WITH control WITH environment)	US- PGPUB:	OR	ON	2018/06/11 18:43

			USPAT; USOCR; FPRS; EPO; IBM_TDB			
S16	147	(desktop ADJ usage)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:49
S17	0	S16 AND (desktop ADJ usage WITH air\$1conditioning)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:50
S18	11	S16 AND (desktop ADJ usage WITH environment\$2)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:51
S19	0	S16 AND (smart SAME room ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:55
S20	0	(smart SAME room ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
S21	0	(smart ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
S22	0	(wire\$1less ADJ device ADJ aware WITH thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
S23	2024	(smart ADJ thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:00

S24	6	S23 AND (smart ADJ thermostat) SAME ((computer desktop TV) ADJ2 usage)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:01
S25	17235	(occupant NEAR10 detect\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:05
S27	13997	(occupant NEAR5 detect\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:06
S28	9	S27 AND (occupant NEAR5 detect\$3) SAME ((computer desktop) WITH use)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:07
S29	7	S27 AND (occupant NEAR5 detect\$3) SAME (CUBICLE)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:10
S30	8	smart ADJ building ADJ energy ADJ management	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:17
S31	1	(12/041472).APP.	USPAT; USOCR	OR	ON	2018/06/11 19:39
S32	181	("20030216837" "20040225649" "20050234596" "20050275525" "20060026972" "20060111816" "5097672" "6067477" "6604023" "6756998" "6792319" "6832120" "6912429" "7055759" "7130719" "7187986" "7343226" "7436292" "7440809" "7480534" "7529646").PN. OR ("7904209").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:39
S33	154	S32 AND (computer)	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S34	145	S32 AND (computer) AND user	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43

S35	78	S32 AND (computer) NEAR10 user	US- PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L11	0	((monitor WITH temperature) SAME (user ADJ interface SAME (computer laptop)) AND (HVAC) AND (probability AND activit AND user AND content) AND video); CLM	USPAT	OR	ON	2018/12/20 14:35
L14	10068	F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2125/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).opc.	USPAT	OR	ON	2018/12/20 14:36
L17	10163	G05D23/00; F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).opc.	USPAT	OR	ON	2018/12/20 14:55

12/20/2018 3:03:56 PM

CA Users: aojha\ Documents: EAST\ Workspaces: 15002791.wsp

Bibliographic Data

Application No: 15/002,791

Foreign Priority claimed: ☐ Yes ☒ No35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:

/AJAY QJHA/

Examiner's Signature

Initials

Title:

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS
A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/21/2016	700	2824	EFACT.011C2
RULE			

APPLICANTS

EcoFactor, Inc., Redwood City, CA, UNITED STATES

INVENTORS

John Douglas Steinberg Millbrae, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 13470074 (08/11/2012 PAT 9244470)

13470074 is a CON of 12502064 (07/13/2009 PAT 8180492)

12502064 has PRO of 61134714 (07/14/2008)

FOREIGN APPLICATIONS**IF REQUIRED, FOREIGN LICENSE GRANTED****

02/04/2016

**** SMALL ENTITY ******STATE OR COUNTRY**

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3040 MAIN STREET

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IRVINE, CA 92614

UNITED STATES

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	15/002,791	Filing Date	2016-01-21	Docket Number (if applicable)	EFACT.01102	Art Unit	2824
First Named Inventor	John Douglas Steinberg			Examiner Name	Ajay Ojha		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ The RCE fee under 37 CFR 1.17(c) is required by 37 CFR 1.114 when the RCE is filed.
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
Deposit Account No. 111410

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	John King/	Date (YYYY-MM-DD)	2018-09-21
Name	John King	Registration Number	34362

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT

First Inventor :	John Douglas Steinberg
App. No. :	15/002791
Filed :	January 21, 2016
For :	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner :	Ojha, Ajay
Art Unit :	2824
Conf. No. :	4939

Mail Stop RCE

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed within three months of the filing date or date of national phase entry, with an RCE or before receipt of a First Office Action after an RCE, and no fee is believed to be required.

Application No.: 15/002791
Filing Date: January 21, 2016

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: September 21, 2018

By: /John R. King/

John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20995
(949) 760-0404

29094656

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	9,791,839	10/17/2017	Matsuoka et al.	
	2	10,018,371 (EFACT.007C2)	07/10/2018	Steinberg et al.	
	3	10,048,706 (EFACT.014A)	08/14/2018	Hublou et al.	
	4	2018/0216841	08/02/2018	Steinberg	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

29094481

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

EFACT.011C2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	: John Douglas Steinberg
App. No.	: 15/002,791
Filed	: January 21, 2016
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ojha, Ajay
Art Unit	: 2824
Conf. No.	: 4939

RESPONSE TO FINAL OFFICE ACTION DATED JUNE 15, 2018

Mail Stop RCE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Final Office Action dated June 15, 2018, Applicant respectfully submits the following in connection with a Request for Continued Examination under 37 C.F.R. § 1.114:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Application No.: 15/002,791

Filing Date: January 21, 2016

AMENDMENTS TO THE CLAIMS

Please amend Claims 1 and 10 as indicated below.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint and at least a second HVAC temperature setpoint;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface that can be used to view video content, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and

Application No.: 15/002,791

Filing Date: January 21, 2016

keeping said current HVAC temperature setpoint based upon said input from said one or more users.

2. (Original) The method of Claim 1 wherein said wireless device is a remote control.

3. (Original) The method of Claim 1 wherein said wireless device is a wireless phone.

4. (Original) The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. (Original) The method of Claim 1 wherein said wireless device is a tablet computer.

6. (Original) The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server.

7. (Original) The method of Claim 1 in which said wireless device communicates with a remote server.

8. (Original) The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. (Original) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

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10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint;

at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface that can be used to view video content, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint,

said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by the video content of the program or channel being viewed by said occupant on or with said wireless device and where said video content is not explicitly related to temperature setpoints;

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

11. (Original) The system of Claim 10 wherein said wireless device is a remote controller.

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12. (Original) The system of Claim 10 wherein said wireless device is a wireless phone.

13. (Original) The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. (Original) The system of Claim 10 said wireless device is a tablet computer.

15. (Original) The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

16. (Original) The system of Claim 10 wherein said wireless device communicates with a remote server.

17. (Original) The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. (Original) The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

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REMARKS

The June 15, 2018 Office Action was based upon pending Claims 1-18. This Amendment amends Claims 1 and 10. Thus, after entry of this Amendment, Claims 1-18 are pending and presented for further consideration.

REJECTION OF CLAIMS 1-18 UNDER 35 U.S.C. § 112

Claims 1-18 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner found that the limitation in independent claims 1 and 10 claiming "the program or channel being viewed" lacked sufficient antecedent in the claims.

Applicant has amended claims 1 and 10 to provide antecedent basis for the limitations.

REJECTION OF CLAIMS 1-18 ARE REJECTED UNDER 35 U.S.C. § 103(a)

Claims 1-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny (hereinafter "Podgorny") in view of U.S. Publication No. 2009/0065596 to Seem (hereinafter "Seem").

The Examiner found that the limitation "where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device" is disclosed in ¶ 0065 of Seem. Applicant respectfully disagrees. Paragraph 0065 of Seem, in its entirety, provides:

"Referring now to FIG. 9, a flow chart of a process **900** for providing a user interface for updating user comfort preferences is shown, according to an exemplary embodiment. The user interface may be similar to interface **702** shown in FIGS. 7A and 7B. **A control system can generate and display a user interface for use by a local and remote user for entering comfort preferences (step 902).** The control system can receive the input (step **904**) after various prompting by the user

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interface, and store or update the comfort preferences in a database and/or in memory configured to associate the preferences with a unique identifier of a user's portable electronic device (step **906**). The comfort preferences can be used by, for example, process **800** to adjust a building automation system setting.” (Emphasis Added)

Applicant submits that Seem merely discloses the use of an interface for adjusting temperature settings on the user's portable electronic device. It does not disclose using said device for viewing unrelated programming, or for inferring information about the user from said programming. In contrast, the subject invention expressly discloses such use.

“For example, if computer **104** indicates to server **106** that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer **104** indicates that it is being used to watch children's programming, server **106** may conclude that a child is watching. In step **1410** the server transmits a query to the user in order to verify the match, asking, in effect, ‘Is that you. Bob?’” (Application at ¶40.)

Applicant believes this distinction should be sufficient to overcome the Examiner's objection. However, Applicant has further amended the independent claims to make the distinction more explicit.

Applicant respectfully submits that the submitted amendments overcome the Examiner's objections, and that the application is now in condition for allowance.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/994,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg	12/502,064 Now Pat. 8,180,492	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Now Pat. 8,498,753	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	12/774,580 Now Pat. 8,740,100	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Now Pat. 8,596,550	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Now Pat. 8,556,188	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Now Pat. 8,131,497	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Now Pat. 8,131,506	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	13/219,381 Now Pat. 9,134,710	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Now Pat. 8,423,322	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	13/329,117 Now Pat. 8,340,826	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/409,697 Now Pat. 8,412,488	03/01/12	EFACT.004C2	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/409,729 Now Pat. 8,886,488	03/01/12	EFACT.005C2	System And Method For Calculating The Thermal Mass Of A Building

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	13/470,074 Now Pat. 9,244,470	05/11/12	EFACT.011C1	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Hublou et al.	13/523,697 Published As 2013/0338837	06/14/12	EFACT.014A	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Steinberg	13/725,447 Now Pat. 8,712,590	12/21/12	EFACT.013C2	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/852,577 Now Pat. 8,738,327	03/28/13	EFACT.004C3	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/858,710 Now Pat. 8,751,186	04/08/13	EFACT.005C3	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/861,189 Now Pat. 9,057,649	04/11/13	EFACT.006C2	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	13/952,253 Abandoned	07/26/13	EFACT.009C1	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	14/048,932 Now Pat. 8,840,033	10/08/13	EFACT.012C1	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/082,675 Now Pat. 9,194,597	11/18/13	EFACT.007C1	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/263,762 Now Pat. 9,188,994	04/28/14	EFACT.013C3	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	14/285,384 Published As 2015/0043615 Abandoned	05/22/14	EFACT.004C4	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	14/292,377 Now Pat. 9,279,594	05/30/14	EFACT.008C1	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	14/491,554 Now Pat. 9,709,292	09/19/14	EFACT.012C2	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/527,433 Published As 2015/0120235 Abandoned	10/29/14	EFACT.005C4	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	14/731,221 Now Pat. 9,939,333	06/04/15	EFACT.006C3	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Cheung et al.	14/842,134 Published As 2016/0061474	09/01/15	EFACT.010C2	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	14/878,872 Now Pat. 10,018,371	10/08/15	EFACT.007C2	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/920,063 Abandoned	10/22/15	EFACT.013C4	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg	15/002,791 Published As 2016/0138822	01/21/16	EFACT.011C2	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Steinberg	15/047,352 Now Pat. 9,982,905	02/18/16	EFACT.008C2	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/060,226 Published As 2016/0258822 Now Abandoned	03/03/16	EFACT.005C5	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	15/097,078 Published As 2016/0363337	04/12/16	EFACT.009C2	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	15/426,882 Published As 2017/0241662	02/07/17	EFACT.005C6	System And Method For Calculating The Thermal Mass Of A Building

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	15/616,719 Published As 2017/0336090	06/07/17	EFACT.012C3	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Okita et al.	15/707,686	09/18/17	EFACT.018A2	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,735	09/18/17	EFACT.018A1	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,753	09/18/17	EFACT.018A3	Occupancy Determination Using Energy Consumption Indications
Okita et al.	15/707,769	09/18/17	EFACT.019A2	Systems And Methods For Acclimatization-Based Variable Thermostat Settings
Okita et al.	15/707,829	09/18/17	EFACT.019A1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Okita et al.	15/707,873	09/18/17	EFACT.019A3	Systems And Methods For Fan Delay-Based Variable Thermostat Settings
Okita et al.	15/713,318 Published As 2018/0087795	09/22/17	EFACT.017A2	Multi-Function Thermostat
Okita et al.	15/713,358 Published As 2018/0087793	09/22/17	EFACT.017A1	Multi-Function Thermostat
Steinberg et al.	15/836,688 Now Abandoned	12/08/17	EFACT.004C5	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	15/841,039 Published As 2018/0216841	12/13/17	EFACT.013C5	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	15/905,251	02/26/18	EFACT.006D1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	15/965,339	04/27/18	EFACT.008C3	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption

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Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	15/994,532	05/31/18	EFACT.004C6	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	16/028,230	07/05/18	EFACT.007C3	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing references for consideration. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited

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references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 09/21/18

By: /John R. King/
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995
(949) 760-0404

28500605

Electronic Patent Application Fee Transmittal

Application Number:	15002791			
Filing Date:	21-Jan-2016			
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King			
Attorney Docket Number:	EFACT.011C2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	2251	1	100	100
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
Total in USD (\$)				750

Electronic Acknowledgement Receipt

EFS ID:	33795594
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Gustavo Lopez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	21-SEP-2018
Filing Date:	21-JAN-2016
Time Stamp:	20:02:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$750
RAM confirmation Number	092418INTEFSW20031900
Deposit Account	111410
Authorized User	Gustavo Lopez

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE.pdf	1349980	no	3
			dd5a07cc5d1a078a52cc8657a32905ce9f46685c		

Warnings:**Information:**

2	Transmittal Letter	IDS_Trans.pdf	18566	no	2
			9152c4c01cc97c91c3123c9a800f1ccca785706c4		

Warnings:**Information:**

3	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	22840	no	1
			af8c0f66a16f04c087a20d39396c1a628953c262dc		

Warnings:**Information:**

This is not an USPTO supplied IDS fillable form

4		Amends.pdf	67895	yes	14
			9403afe5d03ce09617a57ce9326a33d37f0b63081		

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	5
Applicant Arguments/Remarks Made in an Amendment	6	14

Warnings:**Information:**

5	Fee Worksheet (SB06)	fee-info.pdf	32456 F:\R\093\doc\Bac\056R067\B72\9\doc\73 97.d001	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	1491737
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Serial Number 15/002,791		Filing Date 01/21/2016		<input type="checkbox"/> To be Mailed	
Substitute for Form PTO 876									
ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO									
APPLICATION AS FILED - PART I									
FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE (\$)		FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A					
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A					
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(a), (b), & (c))	N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(a))	minus 20 =			x \$40 =					
INDEPENDENT CLAIMS (37 CFR 1.16(a))	minus 5 =			x \$210 =					
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(c))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(B) and 37 CFR 1.15(c).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT* (37 CFR 1.16(d))									
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL				
APPLICATION AS AMENDED - PART II									
AMENDMENT	09/21/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(a))	* 18	minus ** 20	= 0		x \$50 =	0		
	Independent (37 CFR 1.16(a))	* 2	minus *** 5	= 0		x \$230 =	0		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))								
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADDL. FEE		0	
AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(a))	*	minus **	=		x \$0 =			
	Independent (37 CFR 1.16(a))	*	minus ***	=		x \$0 =			
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(c))								
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADDL. FEE			
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.						LIE			
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20"						20			
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 5, enter "5"						5			
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,791	01/21/2016	John Douglas Steinberg	EFACT,011C2	4939
20995	7590	06/15/2018	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			OJHA, AJAY	
2040 MAIN STREET			ART UNIT	PAPER NUMBER
FOURTEENTH FLOOR				
IRVINE, CALIFORNIA 92614			2824	
UNITED STATES OF AMERICA			NOTIFICATION DATE	DELIVERY MODE
			06/15/2018 ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com

jayna.cartee@knobbe.com

Office Action SummaryApplication No.
15/002,791Applicant(s)
Steinberg, John DouglasExaminer
AJAY CHHAArt Unit
2824AIA Status
No**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.

Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 122).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(c).

Status1) ☒ Responsive to communication(s) filed on Amendment/Req.-After Non-Final Reject - 05/15/2018.☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____.2a) ☒ This action is **FINAL**.2b) ☐ This action is non-final.3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.**Disposition of Claims***5) ☒ Claim(s) 1-18 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.7) ☒ Claim(s) 1-18 is/are rejected.8) ☐ Claim(s) _____ is/are objected to.9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.**Application Papers**10) ☐ The specification is objected to by the Examiner.11) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 11912) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).**Certified copies:**a) ☐ All b) ☐ Some** c) ☐ None of the:1. ☐ Certified copies of the priority documents have been received.2. ☐ Certified copies of the priority documents have been received in Application No. _____.3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)1) ☐ Notice of References Cited (PTO-892)3) ☐ Interview Summary (PTO-413)

Paper No.(s)/Date _____

2) ☒ Information Disclosure Statement(s) (PTO/89-08a and/or PTO/89-08b)4) ☐ Other: _____Paper No.(s)/Mail Date 06/15/2018

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DETAILED ACTION

General Remarks

1. The present application is being examined under the pre-AIA first to invent provisions.
2. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
3. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
4. Applicants seeking an interview with the examiner, including WebEx Video Conferencing, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
5. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 10.
 - b. Amended: 1 and 10.
 - c. Pending: 1-18.

IDS

6. Applicant's IDS(s) submitted on 05/15/2018 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has/have considered by the examiner and made of record.

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Double Patenting

7. Double Patenting rejection against US 9,244,470 has been withdrawn in view of the Terminal Disclaimer approved on 05/15/2018.

Claim Rejections - 35 USC § 112

8. Claims 1-18 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Amended Claims 1 and 10 (and dependent claims 2-9 and 11-18), recites the limitation "the program or channel being viewed" in lines 13 and 16 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of AIA 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim(s) 1-18 is/are rejected under AIA 35 U.S.C. 103 as being unpatentable over US 2008/0281472 (hereinafter "Podgorny") in view of US 2009/0065596 (hereinafter "Seem").

Re: Independent Claim 1, Podgorny discloses a method for varying temperature setpoints for an HVAC system (Podgorny abstract) comprising:

storing at least a first HVAC temperature setpoint (Podgorny ¶¶ [0092] and [0019] "user preferences stored" in occupied/non-occupied) and at least a second HVAC temperature setpoint

(Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

monitoring an activity status of at least one wireless device (Podgorny FIG. 2 element 508 wireless device) associated with one or more occupants of said structure (Podgorny ¶ [0083] "detects the presence of the user in the Environmental Zone" which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (Podgorny ¶ [0027] "graphical user interface" and ¶¶ [0067], [0080]), wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (Podgorny ¶ [0083] "keyboard activity monitoring");

determining a probability that the specific activity status of said wireless device (Podgorny ¶ [0093] "identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number" and ¶ [0005]) is associated with the use of said wireless device by a specific occupant or occupants of said structure (Podgorny abstract "autonomous process control" is automatic and "occupancy sensor that recognizes the presence");

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint (Podgorny ¶ [0021] "maintain the environmental parameters temperature" which examiner interpreted that to maintain temperature it determine HVAC temperature setpoint associated with HVAC system and ¶¶ [0008], [0029]-[0030] and [0063]);

Podgorny fails to disclose:

where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device;

prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and keeping said current HVAC temperature setpoint based upon said input from said one or more users.

Seem discloses:

where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device (Seem Fig. 9 and ¶ [0065] discloses how user presence can be determined based on interaction of the user with the User Interface program that generates the User Interface in step 902);

prompting said one or more users (Seem ¶ [0062] “user to specify any number of personal comfort settings” which means prompting said one or more users based on said determining that said one or more of said user's input should be obtained and ¶ [0065]), wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system (Seem Figs. 8-9 and ¶ [0065] “prompting by the user interface” which means prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system);

in response to said prompting, receiving input from said one or more users (Seem ¶ [0065] “process 800 to adjust a building automation system setting” which means in response to said prompting, receiving input from said one or more users); and

keeping said current HVAC temperature setpoint based upon said input from said one or more users (Seem Fig. 11 element 1120 “adjust HVAC for normal conditions” which examiner interpreted as current setting based on the input from users and paragraph 0070).

Podgorny and Seem disclose home automation and HVAC control system. Seem discloses message communication to various wireless devices including personal wireless devices. It would have

been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending wireless messages, as taught by Seem in order to improve control of environmental conditions to reflecting individual preferences, as suggested by Seem (Seem ¶ [0003]).

Re: Independent Claim 10, Podgorny discloses a system for altering the setpoint on a thermostat for space conditioning of a structure (Podgorny Figs. 1 and 22) comprising:

at least one thermostat having at least a first temperature setpoint (Podgorny ¶¶ [0092] and [0019] “user preferences stored” in occupied/non-occupied) and at least a second temperature setpoint (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

at least one wireless device (Podgorny FIG. 2 element 508 wireless device) associated with one or more occupants of said structure (Podgorny ¶ [0083] “detects the presence of the user in the Environmental Zone” which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (Podgorny ¶ [0027] “graphical user interface” and ¶¶ [0067], [0080]), wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (Podgorny ¶ [0083] “keyboard activity monitoring”);

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device (Podgorny ¶ [0059] “status monitoring and data collection”) and whether said thermostat is set to said first temperature setpoint (Podgorny ¶ [0089] “occupancy sensor shuts the system down when users are away from their workstations” which means thermostat is set to said first temperature setpoint that indicates said structure is not occupied and ¶¶ [0009] and [0019]),

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said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device (Podgorny ¶ [0093] “identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number” and Podgorny ¶ [0005]) by a specific occupant or occupants of said structure (Podgorny abstract “autonomous process control” is automatic and “occupancy sensor that recognizes the presence”);

Podgorny fails to disclose:

where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device;

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

Seem discloses:

where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device (Seem Fig. 9 and ¶ [0065] discloses how user presence can be determined based on interaction of the user with the User Interface program that generates the User Interface in step 902);

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat (Podgorny ¶ [0062] “user to specify any number of personal comfort settings” which means prompting said one or more users

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based on said determining that said one or more of said user's input should be obtained and ¶ [0065]) is set to one of said first temperature setpoint or said second temperature setpoint (Podgorny Figs. 8-9 and ¶ [0065] "prompting by the user interface" which means prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system); and

wherein said application in response to said prompting, receives input from said one or more users (Podgorny ¶ [0065] "process 800 to adjust a building automation system setting" which means in response to said prompting, receiving input from said one or more users); and

wherein said current temperature setpoint is set based upon said input from said one or more users (Podgorny Fig. 11 element 1120 "adjust HVAC for normal conditions" which examiner interpreted as current setting based on the input from users and ¶ [0070]).

Podgorny and Seem disclose home automation and HVAC control system. Seem discloses message communication to various wireless devices including personal wireless devices. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending wireless messages, as taught by Seem in order to improve control of environmental conditions to reflecting individual preferences, as suggested by Seem (Seem ¶ [0003]).

Re: Claims 2 and 11, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a remote control (Seem ¶ [0067] "remote control 1006 may be configured to wirelessly communicate" and Fig. 10 which means wireless device is a remote control and ¶ [0043] describes "portable wireless device 306" which is a wireless device and it is a remote control).

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Re: Claims 3 and 12, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a wireless phone (Seem ¶ [0043] "cell phone, PDA, or any other device with transmitting capability", here "cell phone is a wireless phone", which means wireless device is a wireless phone).

Re: Claims 4 and 13, Podgorny and Seem discloses all the limitations of claims 3 or 12 on which these claims depend. They further disclose:

wherein said wireless phone is connected to a cellular network (Podgorny ¶ [0005] "wireless converged networks" which means wireless phone is connected to a cellular network).

Re: Claims 5 and 14, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a tablet computer (Seem Figs. 2, 3 and ¶¶ [0029]-[0032], [0043] disclose multiple portable device, e.g. 104 construed as a tablet and 306)

Re: Claims 6 and 15, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server (Seem ¶ [0008] " server computer further includes a processing circuit for accessing a memory device storing the program code" and "program code for adjusting the building automation" which examiner interpreted that it a remote server and first and second HVAC

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temperature setpoints are stored in a database associated with the remote server and Fig. 2 element 130 is the "server").

Re: Claims 7 and 16, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

in which said wireless device communicates with a remote server (Seem ¶ [0032] "140 configured to accept a signal or input from various portable wireless devices" and Fig. 2 shows that wireless devices are communicating with a server, element 130 of Fig. 2 is a "server" and elements 502, 506 and 508 of Fig. 2 are "wireless device").

Re: Claims 8 and 17, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

further comprising adjusting said current HVAC temperature setpoint with a remote computer (Podgorny abstract, the user controlling "over the internet" at a remote computer and Seem at et. ¶ [0026], [0029] and Fig. 2 describe same limitations).

Re: Claims 9 and 18, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users (Podgorny abstract "autonomous process control and interaction with system users", which means first HVAC temperature setpoint is varied automatically (autonomous) based on said input from one or more users).

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Response to Arguments

11. Applicant's arguments with respect to claim(s) 1-18 have been considered but are moot because the arguments do not apply to the new ground(s) of rejection presented in this Office action, necessitated by the applicant's amendment.

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Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is (571)272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571)272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer

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Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/

Primary Examiner, Art Unit 2824

ajay.ojha@uspto.gov

Search Notes 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	02/13/2018	AO
Refreshed search.	06/11/2018	AO

CPC Combination Sets - Searched*		
Symbol	Date	Examiner


US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search. See search history.	02/13/2018	AO
Refreshed search. See search history.	06/11/2018	AO

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/AJAY OJHA/ Primary Examiner, Art Unit 2824	
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<p><i>Index of Claims</i></p> 	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/002,791	Steinberg, John Douglas
	Examiner	Art Unit
	AJAY GUHA	2824

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

[illegible]

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	9	"20150651474" "9244470" "9279594" "20060263965" "20060083234" "20092065596".PN.	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:03
L3	3	(WO-2009036754-S).DID.	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:38
L4	0	(desktop ADJ us\$3 WITH control ADJ3 temperature)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:38
L5	18	(desktop ADJ us\$3 WITH control WITH environment)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:43
L6	147	(desktop ADJ usage)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:49
L7	0	3 AND (desktop ADJ usage WITH air\$1conditioning)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:50
L8	11	5 AND (desktop ADJ usage WITH environment\$2)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDS	OR	ON	2018/06/11 18:51
L9	0	5 AND (smart SAME room ADJ temperature)	US-	OR	ON	2018/06/11

0080

		ADJ control)	PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB			18:55
L10	0	(smart SAME room ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
L11	0	(smart ADJ temperatuer ADJ control)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
L12	0	(wire\$1less ADJ device ADJ aware WITH thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 18:56
L13	2024	(smart ADJ thermostat)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:00
L14	6	13 AND (smart ADJ thermostat) SAME ((computer desktop TV) ADJ2 usage)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:01
L15	17235	(occupant NEAR10 detect\$3)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:05
L17	13997	(occupant NEAR5 detect\$3)	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:06
L18	9	17 AND (occupant NEAR5 detect\$3) SAME ((computer desktop) WITH use)	US- PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2018/06/11 19:07

			IBM_TDB			
L19	7	17 AND (occupant NEAR5 detect\$3) SAME (CUBICLE)	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:10
L20	8	smart ADJ building ADJ energy ADJ management	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/06/11 19:17
L21	1	(12/041472).APP.	USPAT; USOCR	OR	ON	2018/06/11 19:39
L22	181	("20030216837" "20040225649" "20050234596" "20050275525" "20060026972" "20060111816" "5097672" "6067477" "6604023" "6756998" "6792319" "6832120" "6912429" "7055759" "7130719" "7187986" "7343226" "7436292" "7440809" "7480534" "7529646").PN. OR ("7904209").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:39
L23	154	22 AND (computer)	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
L24	145	22 AND (computer) AND user	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
L25	76	22 AND (computer) NEAR10 user	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/11 19:43
S1	149	((("STEINBERG") near3 ("John"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	("EcoFactor").AS,AANM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 09:40
S3	46883	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).opc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND user\$1 AND wireless).CLM.	US-PGPUB; USPAT; USOCR;	OR	ON	2018/02/07 10:03

			FPRS; EPO; IBM TDB			
56	15	("9244470")	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	CN	2018/02/07 18:11
56	9	("9244470")	USPAT	OR	CN	2018/02/07 18:12
57	25	"20040117330" "20090065596" "20150525691" "6700224" "20130173064" "20040132314" "6348074" "7869907" "6850948" "9057649" "20140316581" "20150120236" "7205870" "20130178585") PN.	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	CN	2018/02/07 18:05
58	4	("20060281472" "20090065596")	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	CN	2018/02/07 18:12
510	32	[US-20010025349-\$ US-20040117330-\$ US-20040133314-\$ US-20060063834-\$ US-20090005070-\$ US-20090018673-\$ US-20090067426-\$ US-20090062970-\$ US-20090271013-\$ US-20130073094-\$ US-20170241662-\$ US-20170336090-\$ US-20180087793-\$ US-20180087795-\$ US-1234567-\$ US-4270693-\$ US- 4702305-\$ US-4702413-\$ US-5297838-\$ US-6454511-\$ US-5706190-\$ US- 5839654-\$ US-6216956-\$ US-6223644-\$ US-6449534-\$ US-6454177-\$ US- 6845918-\$ US-6981383-\$ US-7983795-\$ US-9709292-\$ US-9939333-\$] D10	US- PGPUB; USPAT; USOCR; FPRS; EPO; IBM TDB	OR	CN	2018/06/11 18:22
511	31	"0015616" "20010025349" "20040117330" "20040133314" "20060063834" "20090005070" "20090018673" "20090057426" "20090062970" "20090271013" "20130073094" "20170241662" "20170336090" "20180087793" "20180087795" "4270693" "4702305" "4702413" "5297838" "6454511" "5706190" "5839654" "6216956" "6223644" "6449534" "6454177" "6845918" "6981383" "7983795" "9709292" "9939333") PN.	US- PGPUB; USPAT	OR	CN	2018/06/11 14:20

EAST Search History (Interference)

< This search history is empty >

6/11/2018 8:58:11 PM

CA Users: aojhan Documents: EAST Workspaces: 15002791.wsp

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
SHEET 1 OF 2	Examiner	Ojha, Ajay
	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	15/616,719	06/07/2017	Steinberg, et al.	
	2	4,270,693	06/02/1981	Hayes	
	3	4,702,305	10/27/1987	Beckey et al.	
	4	4,702,413	10/27/1987	Beckey et al.	
	5	5,297,838	03/15/1994	Juravich	
	6	5,454,511	10/03/1995	Van Ostrand et al.	
	7	5,706,190	01/06/1998	Russ et al.	
	8	5,839,654	11/24/1998	Weber	
	9	6,216,956	04/17/2001	Ehlers et al.	
	10	6,223,544	05/01/2001	Seem	
	11	6,449,534	09/10/2002	Stewart	
	12	6,454,177	09/24/2002	Sasao et al.	
	13	6,845,918	01/25/2005	Rotondo	
	14	6,981,383	01/03/2006	Shah et al.	
	15	7,983,795	07/19/2011	Josephson et al.	
	16	9,709,292 (EFACT.012C2)	07/18/2017	Steinberg	
	17	9,939,333 (EFACT.006C3)	04/10/2018	Steinberg et al.	
	18	2001/0025349	09/27/2001	Sharood et al.	
	19	2004/0117330	06/17/2004	Ehlers et al.	
	20	2004/0133314	07/08/2004	Ehlers et al.	
	21	2008/0083834	04/10/2008	Krebs et al.	
	22	2009/0005070	01/01/2009	Forstall et al.	
	23	2009/0018673	01/15/2009	Dushane et al.	
	24	2009/0057426	03/05/2009	Sullivan et al.	
	25	2009/0062970	03/05/2009	Forbes et al.	
	26	2009/0271013	10/29/2009	Chen	
	27	2013/0073094	03/21/2013	Knapton et al.	
	28	2017/0241662	08/24/2017	Steinberg et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
(Multiple sheets used when necessary)	Examiner	Ojha, Ajay
SHEET 2 OF 2	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	2017/0336090	11/23/2017	Steinberg	
	30	2018/0087793	03/29/2018	Okita et al.	
	31	2018/0087795	03/29/2018	Okita et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	32	EP 1102500 A2	05/23/2001	Lucent Technologies Inc.		
	33	EP 2372263 A2	05/10/2011	Mitsubishi Electric Corporation		
	34	GB 2408592 A	06/01/2005	Oswald		
	35	WO 2009/036764 A2	03/26/2009	Danfoss A/S		
	36	WO 2011/100427 A2	08/18/2011	Enphase Energy, Inc.		
	37	WO 2011/011404 A1	01/27/2011	Allure Energy, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	38	Office Action in Canadian Application No. 2800491 dated December 7, 2016 (EFACT.012CA).	
	39	Search Report in European Application No. 11787067.5 dated August 14, 2017 (EFACT.012EP).	
	40	Extended Search Report for European Application No. 11818805.1 dated June 9, 2017 (EFACT.013EP).	
	41	Examination Report in Australian Application No. 2013274827 dated April 11, 2017 (EFACT.014AU).	
	42	Extended Search Report for European Application No. 13804057.1 dated June 1, 2016 (EFACT.014EP).	

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Examiner Signature /AJAY OJHA/	Date Considered 06/11/2018
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

Doc Code: DIST.E.FILE

Document Description: Electronic Terminal Disclaimer - Filed

U.S. Patent and Trademark Office
Department of Commerce

Electronic Petition Request	TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT
Application Number	15002791
Filing Date	21-Jan-2016
First Named Inventor	John Steinberg
Attorney Docket Number	EFACT 011C2
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
EcoFactor, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

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as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

- ☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

- ☒ Small Entity
- ☐ Micro Entity
- ☐ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

- ☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application
- Registration Number 34362
- ☐ A sole inventor
- ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application
- ☐ A joint inventor; all of whom are signing this request

Signature	/John R. King/
Name	John R. King

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
Application Number:		15002791		
Filing Date:		21-Jan-2016		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Daniela Lopez		
Attorney Docket Number:		EFACT.011C2		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15002791

Filing Date: 21-Jan-2016

Applicant/Patent under Reexamination: Steinberg

Electronic Terminal Disclaimer filed on May 15, 2018

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	32627280
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Daniela Lopez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	15-MAY-2018
Filing Date:	21-JAN-2016
Time Stamp:	13:58:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$160
RAM confirmation Number	051618INTEFSW13585400
Deposit Account	111410
Authorized User	Daniela Lopez

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	33591	no	2
			0505e632acc721656c08d14801dca2c86d35f5c4		

Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	30693	no	2
			019095d067c217a81a1139cd00d46308193179557		

Warnings:**Information:**

Total Files Size (in bytes):	64284
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

EFACT.011C2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	:	John Douglas Steinberg
App. No.	:	15/002,791
Filed	:	January 21, 2016
For	:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	:	Ojha, Ajay
Art Unit	:	2824
Conf. No.	:	4939

RESPONSE TO OFFICE ACTION DATED FEBRUARY 16, 2018

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Office Action dated February 16, 2018, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Application No.: 15/002,791

Filing Date: January 21, 2016

AMENDMENTS TO THE CLAIMS

Please amend Claims 1 and 10 as indicated below.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint and at least a second HVAC temperature setpoint;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and

keeping said current HVAC temperature setpoint based upon said input from said one or more users.

Application No.: 15/002,791

Filing Date: January 21, 2016

2. (Original) The method of Claim 1 wherein said wireless device is a remote control.

3. (Original) The method of Claim 1 wherein said wireless device is a wireless phone.

4. (Original) The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. (Original) The method of Claim 1 wherein said wireless device is a tablet computer.

6. (Original) The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server.

7. (Original) The method of Claim 1 in which said wireless device communicates with a remote server.

8. (Original) The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. (Original) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint;

at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

Application No.: 15/002,791

Filing Date: January 21, 2016

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint,

said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure, where said probability is determined in part by content of the program or channel being viewed by said occupant on or with said wireless device;

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

11. (Original) The system of Claim 10 wherein said wireless device is a remote controller.

12. (Original) The system of Claim 10 wherein said wireless device is a wireless phone.

13. (Original) The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. (Original) The system of Claim 10 said wireless device is a tablet computer.

15. (Original) The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

Application No.: 15/002,791

Filing Date: January 21, 2016

16. (Original) The system of Claim 10 wherein said wireless device communicates with a remote server.

17. (Original) The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. (Original) The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

Application No.: 15/002,791

Filing Date: January 21, 2016

REMARKS

The February 16, 2018 Office Action was based upon pending Claims 1-18. This Amendment amends Claims 1 and 10.

Thus, after entry of this Amendment, Claims 1-18 are pending and presented for further consideration.

REJECTION OF CLAIMS 1-18 UNDER 35 U.S.C. § 103(a)

In the February 16, 2018 Office Action, Claims 1-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny, et al. (hereinafter "Podgorny") in view of U.S. Publication No. 2009/0065596 to Seem, et al. (hereinafter "Seem").

In response, Applicant has amended independent claims 1 and 10 to include limitations relating to the content the wireless device is being used to consume. See, e.g., Fig 8. Neither Podgorny nor Seem discuss using the content being viewed by an occupant to inform the determination of HVAC settings.

Accordingly, Applicant respectfully requests allowance of the amended claims.

REJECTION OF CLAIMS FOR OBVIOUSNESS-TYPE DOUBLE PATENTING

The Examiner rejected the pending claims under obviousness-type double patenting as being unpatentable over the claims of U.S. Patent No. 9,244,470.

In response, Applicant submits herewith a Terminal Disclaimer in compliance with 37 C.F.R. §1.321(b) and (c). Accordingly, Applicant respectfully requests that the obviousness-type double patenting rejection be withdrawn.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/994,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	12/502,064 Now Pat. 8,180,492	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Now Pat. 8,498,753	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Now Pat. 8,740,100	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Now Pat. 8,596,550	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Now Pat. 8,556,188	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Now Pat. 8,131,497	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Now Pat. 8,131,506	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	13/219,381 Now Pat. 9,134,710	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Now Pat. 8,423,322	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	13/329,117 Now Pat. 8,340,826	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	13/409,697 Now Pat. 8,412,488	03/01/12	EFACT.004C2	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/409,729 Now Pat. 8,886,488	03/01/12	EFACT.005C2	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	13/470,074 Now Pat. 9,244,470	05/11/12	EFACT.011C1	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Hublou et al.	13/523,697 Published As 2013/0338837	06/14/12	EFACT.014A	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems
Steinberg	13/725,447 Now Pat. 8,712,590	12/21/12	EFACT.013C2	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/852,577 Now Pat. 8,738,327	03/28/13	EFACT.004C3	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/858,710 Now Pat. 8,751,186	04/08/13	EFACT.005C3	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/861,189 Now Pat. 9,057,649	04/11/13	EFACT.006C2	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	13/952,253 Abandoned	07/26/13	EFACT.009C1	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	14/048,932 Now Pat. 8,840,033	10/08/13	EFACT.012C1	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/082,675 Now Pat. 9,194,597	11/18/13	EFACT.007C1	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/263,762 Now Pat. 9,188,994	04/28/14	EFACT.013C3	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	14/285,384 Abandoned	05/22/14	EFACT.004C4	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	14/292,377 Now Pat. 9,279,594	05/30/14	EFACT.008C1	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg	14/491,554 Now Pat. 9,709,292	09/19/14	EFACT.012C2	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/527,433 Abandoned	10/29/14	EFACT.005C4	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	14/731,221 Published As 2015/0345822	06/04/15	EFACT.006C3	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Cheung et al.	14/842,134 Published As 2016/0061474	09/01/15	EFACT.010C2	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	14/878,872 Published As 2016/0091219	10/08/15	EFACT.007C2	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/920,063 Abandoned	10/22/15	EFACT.013C4	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg	15/002,791 Published As 2016/0138822	01/21/16	EFACT.011C2	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Steinberg	15/047352 Published As 2016/0238270	02/18/16	EFACT.008C2	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	15/060,226 Now Abandoned	03/03/16	EFACT.005C5	System And Method For Calculating The Thermal Mass Of A Building

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	15/097,078 Published As 2016/0363337	04/12/16	EFACT.009C2	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	15/426,882 Published As 2017/0241662	02/07/17	EFACT.005C6	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	15/616,719 Published As 2017/0336090	06/07/17	EFACT.012C3	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Okita et al.	15/707,735	09/18/17	EFACT.018A1	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,686	09/18/17	EFACT.018A2	Message-Based Demand Response Systems And Methods
Okita et al.	15/707,753	09/18/17	EFACT.018A3	Occupancy Determination Using Energy Consumption Indications
Okita et al.	15/707,829	09/18/17	EFACT.019A1	Systems And Methods For Humidity-Based Variable Thermostat Settings
Okita et al.	15/707,769	09/18/17	EFACT.019A2	Systems And Methods For Acclimatization-Based Variable Thermostat Settings
Okita et al.	15/707,873	09/18/17	EFACT.019A3	Systems And Methods For Fan Delay-Based Variable Thermostat Settings
Okita et al.	15/713,358 Published As 2018/0087793	09/22/17	EFACT.017A1	Multi-Function Thermostat
Okita et al.	15/713,318 Published As 2018/0087795	09/22/17	EFACT.017A2	Multi-Function Thermostat
Steinberg et al.	15/836,688	12/08/17	EFACT.004C5	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	15/841,039	12/13/17	EFACT.013C5	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Application No.: 15/002,791

Filing Date: January 21, 2016

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	15/905,251	02/26/18	EFACT.006D1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing references for consideration. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Application No.: 15/002,791

Filing Date: January 21, 2016

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: May 15, 2018

By: John R. King
John R. King
Registration No. 34,362
Registered Practitioner
Customer No. 20,995

28280674

INFORMATION DISCLOSURE STATEMENT

First Inventor	: John Douglas Steinberg
App. No.	: 15/002,791
Filed	: January 21, 2016
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ojha, Ajay
Art Unit	: 2824
Conf. No.	: 4939

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Copies of any listed foreign and non-patent literature references are being submitted.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after receipt of a First Office Action, but before the mailing date of a Final Action and before the mailing date of a Notice of Allowance. This Statement is accompanied by the fees set forth in 37 CFR 1.17(p).

Application No.: 15/002,791

Filing Date: January 21, 2016

The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: May 15, 2018

By: /John R. King/

John R. King

Registration No. 34,362

Registered Practitioner

Customer No. 20,995

(949) 760-0404

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
SHEET 1 OF 2		Examiner Ojha, Ajay
		Attorney Docket No. EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	15/616,719	06/07/2017	Steinberg, et al.	
	2	4,270,693	06/02/1981	Hayes	
	3	4,702,305	10/27/1987	Beckey et al.	
	4	4,702,413	10/27/1987	Beckey et al.	
	5	5,297,838	03/15/1994	Juravich	
	6	5,454,511	10/03/1995	Van Ostrand et al.	
	7	5,706,190	01/06/1998	Russ et al.	
	8	5,839,654	11/24/1998	Weber	
	9	6,216,956	04/17/2001	Ehlers et al.	
	10	6,223,544	05/01/2001	Seem	
	11	6,449,534	09/10/2002	Stewart	
	12	6,454,177	09/24/2002	Sasao et al.	
	13	6,845,918	01/25/2005	Rotondo	
	14	6,981,383	01/03/2006	Shah et al.	
	15	7,983,795	07/19/2011	Josephson et al.	
	16	9,709,292 (EFACT.012C2)	07/18/2017	Steinberg	
	17	9,939,333 (EFACT.006C3)	04/10/2018	Steinberg et al.	
	18	2001/0025349	09/27/2001	Sharood et al.	
	19	2004/0117330	06/17/2004	Ehlers et al.	
	20	2004/0133314	07/08/2004	Ehlers et al.	
	21	2008/0083834	04/10/2008	Krebs et al.	
	22	2009/0005070	01/01/2009	Forstall et al.	
	23	2009/0018673	01/15/2009	Dushane et al.	
	24	2009/0057426	03/05/2009	Sullivan et al.	
	25	2009/0062970	03/05/2009	Forbes et al.	
	26	2009/0271013	10/29/2009	Chen	
	27	2013/0073094	03/21/2013	Knapton et al.	
	28	2017/0241662	08/24/2017	Steinberg et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	15/002,791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	2824
SHEET 2 OF 2		Attorney Docket No. EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	2017/0336090	11/23/2017	Steinberg	
	30	2018/0087793	03/29/2018	Okita et al.	
	31	2018/0087795	03/29/2018	Okita et al.	

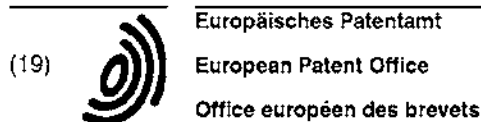
FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	32	EP 1102500 A2	05/23/2001	Lucent Technologies Inc.		
	33	EP 2372263 A2	05/10/2011	Mitsubishi Electric Corporation		
	34	GB 2408592 A	06/01/2005	Oswald		
	35	WO 2009/036764 A2	03/26/2009	Danfoss A/S		
	36	WO 2011/100427 A2	08/18/2011	Enphase Energy, Inc.		
	37	WO 2011/011404 A1	01/27/2011	Allure Energy, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	38	Office Action in Canadian Application No. 2800491 dated December 7, 2016 (EFACT.012CA).	
	39	Search Report in European Application No. 11787067.5 dated August 14, 2017 (EFACT.012EP).	
	40	Extended Search Report for European Application No. 11818805.1 dated June 9, 2017 (EFACT.013EP).	
	41	Examination Report in Australian Application No. 2013274827 dated April 11, 2017 (EFACT.014AU).	
	42	Extended Search Report for European Application No. 13804057.1 dated June 1, 2016 (EFACT.014EP).	

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Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.



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(72) Inventor: **Richton, Robert Ellis**
Morris, New Jersey 07940 (US)

(74) Representative:
Watts, Christopher Malcolm Kelway, Dr. et al
Lucent Technologies (UK) Ltd,
5 Mornington Road
Woodford Green Essex, IG8 0TU (GB)

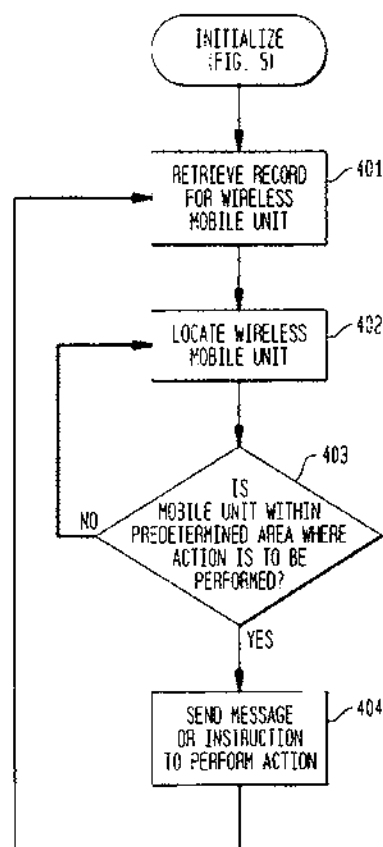
(30) Priority: **15.11.1999 US 440048**

(71) Applicant: **LUCENT TECHNOLOGIES INC.**
Murray Hill, New Jersey 07974-0636 (US)

(54) **Method and apparatus for a wireless telecommunications system that provides location-based action services**

(57) A wireless telecommunications system uses location or position information to initiate actions on behalf of travelers. As position information of a wireless mobile unit is received, it is compared to stored position information of a remote location, such as a home. As the traveler approaches his home, and gets within a certain distance of home, a signal is then sent to a controller within his home to perform an action or instruct the performance of an action.

FIG. 4A



EP 1 102 500 A2

Description**Field Of The Invention**

[0001] The present invention relates to telecommunications in general, and, more particularly, to a wireless telecommunications system.

Description Of Related Art

[0002] FIG. 1 depicts a schematic diagram of a portion of a known wireless telecommunications system, providing wireless telecommunications service to a number of wireless mobile units (e.g., wireless mobile units 101-1 through 101-3) that are situated within a geographic region. The heart of a typical wireless telecommunications system is a wireless switching center ("WSC") 120. Typically, the WSC 120 is connected to a plurality of base stations (e.g., base stations 103-1 through 103-5) that are dispersed throughout the geographic region serviced by the system and to the local and long-distance telephone and data networks (e.g., local-office 130, local-office 138 and toll-office 140). WSC 120 is responsible for, among other things, establishing and maintaining a call between a first wireless mobile unit and a second wireless mobile unit or, alternatively, between a wireless mobile unit and a wireline mobile unit (e.g., wireless mobile unit 150), which is connected to the system via the local and/or long-distance networks.

[0003] The geographic region serviced by a wireless telecommunications system is partitioned into a number of spatially distinct areas called "cells." As depicted in FIG. 1, each cell is schematically represented by a hexagon. In practice, however, each cell has an irregular shape that depends on the topography of the terrain surrounding the cell. Typically, each cell contains a base station, which comprises the radios and antennas that the base station uses to communicate with wireless mobile units in that cell and also comprises the transmission equipment that the base station uses to communicate with the WSC 120. However, locating wireless mobile units within a cell was often difficult.

[0004] Recently, global position systems (GPS) have been developed to the point where they are very cheap to implement. Thus, such systems may soon be prevalent in wireless mobile units to determine precise location thereof. In addition, in the area of wireless technology, assisted GPS is being developed to improve on normal GPS for position or location detection in wireless mobile units. Further, other known systems already exist (such as known triangulation methods) for precisely locating wireless mobile units. And still others are constantly being developed. Therefore, a need exists to create other uses for the location or position information of wireless mobile units.

[0005] Increasingly complex modern life leaves many people eager for means of simplifying their busy lives.

Moreover, there is a tendency to enjoy automating even simple tasks-like automatic opening of garage doors. More and more, such automation is finding its way into homes and offices today. Actions such as turning on lights, ovens, heating/cooling systems, etc. are often done automatically in homes. Familiar systems like these are time based, i.e., based on times of the day. However, as people arrive in their homes at varying times due to irregular work hours, or arrive in their offices at varying times due to irregular home hours, a need exists for automating actions based on something other than time.

Summary of the Invention

[0006] The present invention is directed to a wireless telecommunications system that uses location or position information to initiate actions on behalf of travelers. As position information is received, it is compared to position information of a remote location, such as a home. As the traveler approaches his home, and gets within a certain distance of home a signal is then sent to a controller within his home to perform an action or instruct an action. These actions can include varying temperature within the home, for example.

Brief Description Of The Drawings

[0007] The present invention will become more fully understood from the detailed description given hereafter and the accompanying drawings which are given by way of illustration only, and thus are not limiting of the present invention, wherein like reference numerals represent like elements and wherein,

FIG. 1 is a schematic diagram of a known wireless telecommunications system;

FIG. 2 is a schematic diagram of a wireless telecommunications system including the location-action server of an embodiment of the present invention;

FIG. 3 is a block diagram of the salient components of the location action server of FIG. 2 in conjunction with components of a remote location for performing an action;

FIGS. 4a and 4b are flowcharts illustrating operation at the server and at the remote location;

FIG. 5 is a flowchart depicting the registration steps involved in establishing a location-based action;

FIG. 6 illustrates the controller for controlling/performing exemplary actions; and

FIG. 7 illustrates an example of a location-based ac-

tions.

Detailed Description

[0008] The illustrative embodiment of the present invention enables the use of both the telecommunications capability and the location-finding capability of a wireless telecommunications system. These capabilities are combined to drive actions in the users home, office, or other specified location. In general, the illustrative embodiment performs two fundamentally distinct steps. In accordance with the first step, the movement of a wireless mobile unit is located and an incoming data stream of the user's location is maintained. In accordance with the second step, the illustrative embodiment sets geographically based criteria, at the direction of the user, by which location-based actions are imposed. When the geographically based criteria are met, the wireless system initiates processes resulting in location-dependent actions.

[0009] FIG. 2 is a schematic diagram of a wireless telecommunication system including the location-action server 221 of a preferred embodiment of the present invention. The system includes a wireless switching center (WSC) 220 connecting the location-action server 221 with base stations 203-1 through 203-4, wherein it is understood that the number of base stations is exemplary only. Such a system is capable of: (1) providing wireless telecommunications service to wireless mobile unit 201, including location-based services based on location of the wireless mobile unit 201; (2) monitoring the movement (changing location) of wireless mobile unit 201 as it remotely travels; and (3) providing location-based actions based on the observed changing locations of wireless mobile unit 201. The location server 221 is responsible for providing all location-based action services for wireless mobile unit 201.

[0010] FIG. 3 is a block diagram of the salient components of location-action server 221. The location-action server 221 includes a location-action controller 301. The location-action controller 301 is connected to each of a location-action service database 302; location determining server 303; input device such as a console of an operator 304; and location action and preferences server 305. Location action and preferences server 305 is the part of the location-action server 221 that maintains a profile for each supported user and "understands" the actions that can be taken on behalf of users, e.g., opening a door, turn power onto a given appliance, etc. The location-action and preferences server translates actions from location-action service database 302 into simple commands that can be transmitted to the item/appliance that will perform the action. Further, the location-action and preferences server 305 "understands" the user's preferences (e.g., preference for turning appliances on when user has approached within 2 miles, and opening door when user has approached within 50 feet, for example). The location-action and preferences

server 305 matches user's actions and preferences and maintains the user's specified actions and preferences as a user profile, to be invoked whenever the user calls for location-based action services.

[0011] Location-action controller 301 is, for example, a computer programmed to orchestrate location-based action services. Further, location-action controller 301 controls the operation of the other elements in location-action server center 221.

[0012] Location-action service database 302 is a database or memory that contains, among other things, digitized maps of geographic areas serviced by the location-action server 221 and WSC 220. These are used for comparison with a current location of a wireless mobile unit 201 to determine whether to impose the desired actions. The geographic data and related data may be embodied in a Geographic Information System (GIS), for example. Location-action service database 302 further preferably contains not only the GIS database, but also GIS processing software that enables geographic functions, chiefly determining proximity relationships that enable the functionality described herein as will be explained in more detail hereafter. Some personal preferences may also be established in location-action service database 302, which may create an understanding for the automated processing of concepts such as the home of the user of a wireless mobile unit 201; the user's office, or other places that correspond to a set geographic area that will be conveniently referred to by such common labels as home/office hereafter.

[0013] Location-action service database 302 further preferably stores a list of actions to be performed in association with a designated wireless mobile unit 201 and the geographic area (distance/proximity thresholds) that will be considered to meet a criteria for initiating control of actions to be performed. These can be customized by the user. For example, actions performed when a user approaches/leaves his/her home/office include physical actions such as adjusting environmental conditions (e.g. temperature) and/or lighting, activating/deactivating a home security system, warming an oven, opening/closing garage doors, etc. (when the wireless mobile unit has satisfied a geographic relationship with the remote location, such as coming within a predetermined distance thereof, for example). Such actions are performed at the direction of a home-based central controller 330, such as a home computer (PC) for example. This central controller 330 performs the action, such as sorting email when a user is within 5 miles of his office for example; or directs another action/action controller 320 to perform the action. Any action which can be controlled by a remote signal (which necessarily includes an action performable by any electronic or electrical device) is contemplated to be within the scope of the present invention. This action/action controller 320 can be a controller of a thermostat, light switch, garage door opener, etc. Thus, a remote control system 310 includes a central controller 330 for actions performed directly

thereon, such as email sorting for example, and optionally one or more action/action controller(s) 320. The central controller 330 of the remote control system 310 receives signals instructing performance/control of actions from location-action controller 301 through the WSC 220 and phone lines, either wireless or land-lines, connected to central controller 330 in a known manner.

[0014] Note that while central controller 330 may be employed at the location where these services are performed, its' presence is not essential to the methods disclosed herein. The increasing availability of "smart" appliances (e.g. internet enabled and addressable) make central controller 330 less necessary, especially in the future. Thus, it should be understood that remote control system 310 could include merely "smart" appliances themselves, with actions being directly controlled by location-action controller 301.

[0015] Location determining server 303 determines the location of a wireless mobile unit 201 when requested to do so by location-action controller 301 and provides location-action controller 301 with that information when it is obtained. The location of wireless mobile unit 201 can be determined in a number of known ways including global positioning systems (GPS) and assisted GPS used in conjunction with wireless mobile units, and other known techniques such as triangulation, for example. How the location information is obtained is not limitative of the present invention. Location-action controller 301, in conjunction with location-action and preference server 305, determines the identification of wireless mobile units for which location determining server 303 monitors and identifies position/location information.

[0016] Location-action and preference server 305 works in conjunction with location-action controller 301 to determine which wireless mobile units are to be monitored; what are location thresholds at which actions are to be performed; what actions are to be performed when thresholds are exceeded; etc. The functioning of location-action and preference server 305 includes the set-up and authorization of users and may use Wireless Intelligent network authorization procedures such as those used for set-up of other wireless services such as call-waiting, voice-activated dialing, etc. Details of the functioning of such service profiles will be familiar to those of ordinary skill in the art, as will their set-up, maintenance and termination. This can be a service that a wireless mobile unit user signs up for, for example. The functioning of the location-action and preference server 305 further includes performing of threshold tests and invoking services, when appropriate, as will be described further with regard to Figs. 4 and 5 and their accompanying explanations.

[0017] Operator's console 304 enables travelers (users) to call the location action server 221 to request a service or change of wireless mobile unit 201 in preference in a user's wireless service file, for example. Thus, stored actions/thresholds can be modified. Alternatively, the operator's console 304 could be replaced by auto-

mated processes, linked to menus in the wireless mobile unit 201 of the user, for example. Some of the functionality described above can be automated by using an understanding of related user preferences, such as the options for different output devices that the user may tie to his/her wireless service file, which may be located elsewhere in the wireless network.

[0018] FIG. 4a is a flowchart of the operation of an illustrative embodiment of the present invention, wherein position/location movement of a wireless mobile unit is tracked as it travels during a trip and wherein that information is then used in near realtime to initiate location-based actions. In doing so, the illustrative embodiment performs two fundamentally distinct, major steps: (1) specifying the desired services by the recording actions to be taken on behalf of the user and the geographic conditions under which those actions will be performed, and (2) the continuous monitoring of the user's location against the geographic criteria (threshold position for comparison) for the action: if the conditions are met the action will be performed; if conditions are not met, position/location monitoring will continue as long as the basis for the service remains.

[0019] Prior to step 401 in FIG. 4a, a user of a wireless mobile unit initially decides to subscribe to a location-based action service. The user must have a specific designatable location in mind (which will generally be a familiar location such as home or office or a friend's home, for example), and a specific action or set of actions to be performed at the designated location (it should be noted that the specific actions could be programmed in a home or office PC as will be described with regard to Fig. 6). These actions may be associated with routine events, such as coming to the office to begin the work day or coming home at the end of the work day. The actions are performed based on the fact that the user is about to be physically present at the designated location, i.e., the actions are performed when a user is within a certain distance of the designated location based upon a location of the wireless mobile unit which is with the user.

[0020] Additionally, prior to step 401 of Fig. 4a, the wireless network ascertains that the user is authorized for location-based action services—a step which implies the user has a wireless mobile unit that can be located routinely with little impact on the network. This will often be the case.

[0021] Initially, the process begins with step 401 of Fig. 4a wherein the process is initialized at the location-action server 221. Information regarding actions to be performed, locations at which actions are to be performed, threshold positions at which actions are to be initiated, etc., are stored at location-action server 221. Thus the user essentially subscribes for the service and defines the parameters. This process will be described in more detail with regard to Fig. 5.

[0022] As previously stated, the steps involved in establishing parameters defining where, when, to whom,

and what actions are to be performed are described in Fig. 5, further defining step 401 of Fig. 4. Initially, in step 502, the service to be involved is established. A user interface at the wireless mobile unit 201 might include other services, for example. The user invokes the location-based action service by initializing, either through a menu on his/her wireless mobile phone or through a similar mechanism such as that which could be provided over the Internet. Alternatives to invoking over the Internet include speaking to an operator or using an IPA (Intelligent Personal Agent). Those skilled in the art will recognize how to construct these various alternative devices for invoking/starting the service, but the menu interface is described further here.

[0023] Once in the menu for location-based actions, this user interface presents a list of actions and a list of locations, for example. In more advanced versions, nearly free-form inputs could exist, such that any action that could be understood by an intelligent module of the computer controlling the ultimate actions could be included. The list of actions include opening/unlocking a door, turning on equipment, raising or lowering temperature in the designated target location (such as home or office for example), or any other common actions. Actions ultimately performed in the designated target location within the scope of the present application include all actions which can commonly be driven simply by turning on power. For example, in the case where the actions are to be taken in a "smart home" (as will be described in more detail regarding Fig. 6), the home wiring is built such that all electric power outlets can be computer-controlled, and the home computer can be simply "told" to apply power at a given outlet/circuit or group ("macro") of outlet/circuits. The application of power will then open the garage door, turn on specified equipment, etc.

[0024] Besides specifying the action to be performed in Step 502, the user must specify the geographic conditions under which the service will be invoked in step 503. These are further defined in steps 504 and 506. This establishes the location where actions are performed; the "location-basis" under which actions are performed; and when actions are performed.

[0025] First the user specifies the designated site (target location) that is to be the basis of the action in step 504. The site may be chosen from a pre-programmed stored list, including such items as "home," "office," "secondary office," or "mother's house," etc. These sites, while using familiar names, will be translated by the location action controller 301 into street addresses, latitude/longitude, UTM (Universal Transverse Mercator), or a similar location designation scheme that can be dealt with by a Geographic Information System (GIS). This, and all other selected information is stored at location-action server 221, in a location-action service database 302.

[0026] The geographic criteria or relationship(threshold position/location at which actions are triggered) is

set in Step 505 as the Site Relation Condition. The most common criteria will be proximity. For example, as a proximity threshold the user sets 5 miles such that when the wireless mobile unit 201 is within 5 miles of the designated target location (e.g., his home), then the determined geographic relationship with the designated target will be satisfied and an action will be triggered (e.g., adjust environmental conditions such as temperature or humidity). It should be noted that services could also include entry onto a particular road, municipality, or any geographic area as a triggering threshold for satisfying a geographic relationship. Conversely, it can include leaving any geographic area or reaching a certain distance away from an area or a specific location. Thus, when a user is leaving and is one mile from home, environmental conditions in the home can be automatically adjusted so as not to waste power. Many possible variations can be invoked, particularly if provisioned via a graphical interface such as that included in common GIS or Desktop Mapping schemes (see for examples, the ARC/INFO products from ESRI of Redlands, CA, or MapInfo from MapInfo, Inc. Troy, NY).

[0027] Once the user has specified (1) the action to be taken (e.g. adjusting environmental conditions such as temperature), (2) the location wherein the action should be taken (e.g. "home"), and (3) the criteria or geographic relationship (typically distance within which to invoke the action such as "5 miles" from home, for example), the initialization is nearly complete. However, the system may require other internal settings. The most obvious of these is the tolerance, which can be set in step 506. By tolerance, for example, this refers to the fact that when specifying "perform this action when I am within 1 mile \pm 100 meters", the \pm part is yet to be specified. Because of its subtlety, this part may be specified by the system rather than by the user, for example. The initialization Step 401 is completed by writing the Full Record of Condition in Step 507, which writes the information in Location Action Service Database 302. In step 508, it then indicates that the Location Action Controller 301 may begin its process of verification/authentication, and proceed to begin controlling the service.

[0028] Once the process has been initialized, the wireless network then monitors the location of the wireless mobile unit 201 of the user at regular intervals. Note the wireless mobile unit 201 may contain the functionality needed to locate itself, and may send results to the location service controller 301 (through a controlling base station and WSC 220): such as through GPS or modified GPS circuitry within the wireless mobile unit 201 itself. Alternatively, the location can be determined in a known manner through triangulation using base station information, etc., either at the location action server 221 or WSC 220. Those familiar with wireless location technology/functioning will recognize that for the services disclosed herein, it does not matter whether location results are calculated in the network or in the wireless mobile unit 201 itself.

[0029] For example, and as is clear to those skilled in the art, there are various ways in which the illustrative embodiment can ascertain the location of wireless mobile unit 201. For example, wireless mobile unit 201 can include a satellite position system receiver (e.g., a Global Positioning System (GPS) receiver, etc.) so that wireless mobile unit 201 can determine its own latitude and longitude. In such a case, wireless mobile unit 201 provides its location to a controlling base station, WSC 220, and eventually to location action server 221 when requested. An example of such an arrangement is taught in U.S. Patent 5,479,482, entitled "Cellular Terminal For Providing Public Emergency Call Location Information," issued Dec. 26, 1995.

[0030] In accordance with another technique, wireless mobile unit 201 and location determining server 303 may share the task of computing the latitude and longitude of wireless mobile unit 201. In such a case, wireless mobile unit 201 provides an indicium of its location, through a controlling base station and WSC 220, to location determining server 303 of location action server 221 when requested. An example of such an arrangement is described by G. Vannucci and R.E. Richton in pending U.S. Patent applications Serial No. 08/927,432, and 08/927,434.

[0031] In accordance with other techniques, either wireless mobile unit 201 or base stations 203-1 through 203-4 use of terrestrial triangulation techniques, in a well-known fashion, determine the location of wireless mobile unit 201 based on the time-of-arrival or direction-of-arrival of signals transmitted from each other. It will be clear to those skilled in the art how to determine the location of wireless mobile unit 201 for the purposes of the present invention, and that the reporting of the location to location determining server 303 (from the base stations through WSC 220) at regular intervals requires merely adding a timer, for example. It will similarly be clear to those skilled in the art that wireless location determination systems will have a certain inherent accuracy, and that they generally report a confidence or uncertainty level and that that level might need to be considered when invoking any location-based service. Factoring in consideration of the areas of uncertainty will be part of any location-based service but will not be described at length here, as the considerations should be evident. For example, when criteria for invoking services are examined, the uncertainty/confidence must be considered. Depending on the nature of the action/service, different confidence levels might appropriately be invoked. However, because this is a secondary factor in invoking location-based action services, its use would probably be better left to the administrative parts of location-based services rather than set by users in most cases.

[0032] Following initialization of the service as explained in Fig. 5, the process may begin at Step 401 within the location-action server 221. In step 401, a record of the wireless mobile unit 201, the location cri-

teria or geographic relationship (designated target, threshold, etc.) and the action to be taken is established. This information is stored in a record in a location action service database 302, in association with information identifying the wireless mobile unit 201 (such as its phone number, for example) and in association with information identifying the target location where the actions are to be performed (such as the phone number of a user's office, home, etc.). It should be noted that the record stored in the location-action service database 302 may include all necessary information to carry out the instructing of the action, or may be linked to existing information, such as a known telephone number of the wireless mobile unit 201 and/or known home or office numbers of a user. The aforementioned record and other stored information may be stored in a geographically oriented database, such as are associated with GISs. Location action controller 301 records that such a record exists. At this point in the location-action controller 301 initiates the criteria checking shown in steps 402 and 403.

[0033] The criteria checking steps 402 and 403 are the heart of the system. In step 402, the location of wireless mobile unit 201 is continually determined/received. This is done at periodic intervals, e.g., once per second. Next, in step 403, the retrieved criteria are checked at regular intervals, typically timed to mesh with the timing of step 402. For example, in step 403 it is determined whether or not the location information received in step 402 indicates that the wireless mobile unit has satisfied the geographic relationship with the target location, e.g. is it within a threshold distance (e.g., 5 miles) of the target location (e.g., "home"). These two timed processes are "merged" in a manner to check whether the location of the wireless mobile unit of the user meets the criteria or geographic relationship with the target that has been set.

[0034] It should be noted that the record storage and criteria checking of steps 401-403 need not be limited to a single wireless mobile unit or to a single target location. For example, if a family has two wireless phones, for example, then they may designate that the actions take place when either of the two wireless phones meets the set geographic relationship. This can be set and stored in location-action service database 302. Further, one set of actions can be triggered by either wireless phone meeting a first geographic relationship with a home of the users, for example, and a second set of actions can be stored in association with only one of the wireless phones, for office related actions, for example.

[0035] In addition, for a single wireless mobile unit, multiple geographic relationships can be stored in association therewith, with similar or different actions to be performed. Thus, when a wireless mobile unit of a user satisfies a first set geographic relationship with a first target location (e.g. home), a first set of actions will be triggered at the home. When the same wireless mobile unit satisfies a second set geographic relationship with

a second target location (e.g. office), a second set of actions will be triggered at the office. Accordingly, upon the wireless mobile unit satisfying either of the set geographic relationships with either of the respective target locations, a controls signal will be sent to the respective target to trigger the respective action(s). Therefore, information identifying one or more various wireless mobile units can be stored in association with information of various target remote locations and in association with various set geographic relationships thereof and actions to be performed.

[0036] Further, it should be noted that the monitoring performed in step 402 can be provided to applications other than those in step 403. Further, step 402 can be performed using criteria established outside of step 401. Also note that there will be service provisioning steps that the providers of services described here will undertake before users can employ any steps in Figure 4a. These provisioning steps would include, for example, initiate billing and check that the end-to-end communications protocols required for subsequent steps of the service disclosed are ready. Authentication/security functions may also be established to further protect users against unauthorized disclosures of data regarding their whereabouts (position/location), which many would want to keep private. Methods to perform such provisioning steps are well-known to those skilled in the art, as these are normal functions of public telephone networks for well-known services such as call waiting, caller-ID, etc.

[0037] If the criteria are met in step 403, a control signal or instruction to perform an action is sent in step 404. This is easily accomplished since the location-action server 221 knows the phone number of the remote location where the action is to be performed. If not, location of the wireless mobile unit 201 is monitored in step 402. As noted previously, the action is carried by the location action server 221 sending a prearranged control signal to the remote central computer 330, which in turn directly causes the action to occur (either at central controller 330 for computer actions such as sorting email, for example, or by controlling a remote action/action controller 320 such as a thermostat controller for adjusting environmental conditions such as temperature). If the criteria are not met, the condition is checked again (periodically).

[0038] In the case where the criteria is met in step 403, the location-action controller 301, having "deduced" that the criteria has been met by comparing the criteria stored in location-action database 302 with the most recent location determination result from the location determining server 303, sends a signal to invoke the action. This may include calling a specific telephone number (e.g., the home or office telephone number for the user). One of ordinary skill in the art familiar with this type of pre-programmed controller will recognize that a variety of signals may be used from this point to establish, validate, and invoke the computer-to-computer

communications that enables this step (from location-action server 221 to the remote control system 310). The communications may take place via the Public Switched Telephone Network (PSTN) or any ordinary or extraordinary means.

[0039] The home/office computer (central controller 330) of remote control system 310 that receives the instructions to invoke the action is previously set up to acknowledge the received instruction. Upon receipt of a return acknowledgment, the location-action controller 301 will either cycle to the next service it performs on behalf of the particular user described here, or will stop the processes for that user. An external stop signal, either invoked by the user or a system administrator, can also stop the process at step 403. This external stop signal is typical of administrative steps that are not shown explicitly in the Figures, but whose presence is both required for a practical system and evident to those skilled in the art.

[0040] Fig. 4b is a flowchart illustrating the steps performed at the designated target location, such as at the user's home. Initially, a central controller 330 of remote control system 310 monitors whether or not an instruction to perform an action has been received in step 410. If no instruction has been received, the system merely continues to monitor for receipt of such a signal. However, if the signal has been received from location-action controller 310 of location-action server 221, through the phone lines (either land-line, or wireless) in step 420 it determines which actions are to be performed based on the signal received. Thereafter, in step 430, the central controller the performance of the action by either performing the action itself (if the action is a computer action such as sorting email, for example), or sends a signal to a remote device or controller of a device 320 to perform the action.

[0041] For example, if the action is adjusting temperature, a signal is sent to a thermostat controller, where the signal itself merely controls a thermostat so as to adjust the temperature. It should be noted that the specific parameters of adjusting the temperature or even specific actions to be taken at the remote control system 310 can be programmed therein, such as at the central controller 330 for example. Alternatively, some information could be prestored at location-action service database 302 of location-action server 221, such that a certain signal is sent when a user has departed his home by 1 mile and another signal is sent when a user has arrived within 5 miles of his home, with the actual action to be performed being stored in central controller 330. In such an instance, upon receiving an arrival signal from the location-action server 221, the central controller 330 can perform a first set of actions such as raising the temperature in the house, turning the lights on, opening the garage door, etc. If a second signal is sent from location-action server 221 indicating that a user has departed his home by a predetermined distance for example, then the central controller 330 can be pro-

grammed to perform a different set of actions, such as locking all doors, closing a garage door, lowering temperature in the house, closing a garage door, etc. It should be clear to those of ordinary skill in the art that all variations and permutations thereof are also within the scope of the present invention.

[0042] Fig. 6 illustrates the central controller 330, in a preferred embodiment thereof. As previously stated, such a central controller 330 can include, for example, a home computer. As such, the home computer will include a display portion 610, a CPU 650 connected to the display portion 610, and further connected to memory 680 and an input device 690. The CPU 650 is further connected via input port 660 to a phone line for receiving information from location-action controller 301 of location-action server 221, for example; and an output port 670 for outputting information to control the carrying out of various actions such as adjusting temperature, opening a garage door, turning on and off lights, etc. As previously stated, the specific actions to be performed can be programmed using CPU 650, memory 680, and input device 690 within the central controller 330 itself: certain groups of actions can be performed therein when a particular arrival or departure signal is received from location-action controller 301 of location-action server 221 for example; or specific instruction signals can be received by CPU 650 from location-action controller 301 of location-action server 221 dictating exactly which actions are to be performed or controlled by central controller 330.

[0043] Fig. 6 further illustrates specific elements displayed on display portion 610 of central controller 330, indicating which actions may be performed. It should be noted that the various actions indicated on display portion 610 of Fig. 6 are merely indicated illustrative purposes only and should not be deemed limiting of the present invention.

[0044] First display areas 620a and 620b may, for example, display a symbol indicating a particular action to be performed. The specific word or phrase corresponding to the symbol may optionally be displayed in area 630a and 630b for example. Further, in a separate display area 640a and 640b, it can be indicated whether or not a particular action is ON or OFF. By such a system, using display portion 610 as a touch screen for example, a user can easily program specific actions to be performed when a signal is received from a location-action controller 301 of a location-action server 221 in conjunction with the present application. Additionally, although not shown in Fig. 6, specific control of various actions can take place at the central controller 330 in a similar manner, such as setting the exact that the temperature the home should reach. These "variable parameters" of an action are probably best programmed at central controller 330.

[0045] Software for controlling various devices, such as a coffee pot, lights, etc. is known from companies such as Active Home™, which currently activate devices

in the home based upon a particular time of day for example. Accordingly, similar programming is carried out in connection with the present invention, utilizing location information and external control from a location-action controller 301 of a location-action server 221 in place of the known "time of day" control. Accordingly, in a system wherein a user desires to determine which particular action should take place in his or her home when he is within a particular distance from the home (either arriving or departing), the use of a central controller 330 as shown in Fig. 6 is ideal. As such, a user can turn various actions ON so that when an arrival signal is received from location-action controller 301 of location-action server 221, several actions are performed. Alternatively, the user can cancel some actions if, for example, the user does not desire to turn the coffee pot ON each time he arrives; or can vary the parameters of certain actions (adjusting the temperature by 5 degrees instead of 3 degrees for example).

[0046] Fig. 6 also depicts an arrival macro and a departure macro. As such, a user can string a plurality of tasks together in a macro so that, for example, each time he leaves his house and exceeds the predetermined threshold, such as 1 mile for example, three tasks will be performed (i.e., the lights will be turned OFF, the temperature will be lowered, and the garage door will be shut). Similarly, an arrival macro can be determined and prestored such that when a user is within 5 miles of his home, for example, two tasks will be performed (such as raising the temperature by 5 degrees and turning the lights ON, for example). As such, the actions are more easily controlled by the user.

[0047] Figs. 7a and 7b illustrate one particular example of the system of the present application, Fig. 7a indicating the steps performed at the location-action server 221, and Fig. 7b indicating the steps performed at the remote control system 310.

[0048] In step 710, a record for a wireless mobile unit 201 is retrieved and the location of the wireless mobile unit 201 is monitored. Thereafter, in step 720, actions to be performed are determined, such as adjusting temperature for example, and a threshold distance (as a set geographic relationship) along with the target location, is also determined (namely 5 miles from the home for example). Alternatively, instead of determining exactly which actions are to be performed, a threshold need merely be determined such that if the threshold is met, a signal will be sent from location-action controller to central controller 330 indicating that an action is to be performed; with the action itself being determined at the central controller 330 based upon receipt of an arrival or departure signal for example (such as in a departure/arrival macro).

[0049] Thereafter, in step 730, it is determined whether or not the wireless mobile unit 201 meets the threshold, namely is the wireless mobile unit 201 within 5 miles of the user's home, for example. If not, the system returns to step 710 and the location or position of the wire-

less mobile unit 201 is continually monitored. If so, the system moves to step 740 wherein a signal is sent to the central controller 330 of the user's home. This is done, for example, since the location-action controller 301 knows the home number of the user, stored in association with the telephone number of the wireless mobile unit 201. Thus, a signal can be sent to the user's home via the existing phone lines.

[0050] Fig. 7b illustrates the actions performed at the user's home, for example. Namely, the central controller 330 monitors the phone lines for a control signal from the location-action controller 301 in step 750. In step 760, a signal is received. Thereafter, in step 770, it determines which actions are to be performed, either from the received signal itself or from actions preprogrammed in the computer such as actions which are part of a stored departure macro or an arrival macro, as previously explained with regard to Fig. 6 for example. Thereafter, the action of adjusting the temperature (for example) is performed by the central controller 330 either controlling the temperature (action) itself, or sending a signal to an action controller 320, such as a thermostat controller, for adjusting the temperature. For temperature adjustment, and for other specific actions, exactly how much to adjust the temperature can be specifically stored, for example at the computer or central controller 330 of the user so as to be easily adjustable to the user. When a signal to adjust the temperature is received from the location-action controller 301, the computer can then determine how much to adjust the temperature and output a signal for appropriate control thereof.

[0051] The invention being thus described, it will be obvious that the same may be varied in many ways.

[0052] For example, the structure of location-action service data base 302 is not limiting and need only store, in some fashion, the required information. How information is stored is not limitive of the present invention. Further, the location of the various components of the location-action server 221 is not limitive of the present invention. The components can be in a single unit as shown in Fig. 3, or can be located apart from location-action controller 301. Only operative connection between the components is important. The location-action server 221 of Fig. 3 is merely a description of a preferred structure.

Claims

1. An apparatus comprising:

a controller, adapted to receive information indicating position of a wireless communications device;

a memory, adapted to store information identifying the wireless communication device and

position information of a remote location stored in association with the information identifying the wireless communication device, the controller being adapted to output a control signal to the remote location instructing initiation of an action at the remote location upon received information indicating that the position of the wireless communication device has satisfied a geographic relationship with the remote location.

2. The apparatus of claim 1, wherein the geographic relationship is satisfied when the position of the wireless communication device is within a designated distance of the remote location.

3. The apparatus of claim 1, wherein the controller is adapted to compare position information of the wireless communication device to stored position information of the remote location and is adapted to determine when the wireless communication device has satisfied the geographic relationship.

4. The apparatus of claim 1, wherein the wireless communication device is a wireless phone.

5. The apparatus of claim 1, wherein the position information indicating position of the wireless communication device is received from a global positioning system (GPS) within the wireless communication device.

6. The apparatus of claim 1, wherein the position information indicating position of the wireless communication device is received from an assisted global positioning system (assisted GPS).

7. The apparatus of claim 1, wherein the action initiated at the remote location includes operating a door.

8. The apparatus of claim 1, wherein the action initiated at the remote location includes adjusting environmental conditions at the remote location.

9. The apparatus of claim 1, wherein the action initiated at the remote location includes sorting email.

10. The apparatus of claim 1, wherein the memory stores position information of a plurality of remote locations in association with the information identifying a wireless communication device.

11. The apparatus of claim 10, wherein the controller is adapted to output a control signal to one of the plurality of remote locations upon receiving information indicating that the position of the wireless communication device is within a designated distance of the one of the plurality of the remote locations.

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12. The apparatus of claim 1, wherein the memory stores information identifying a plurality of wireless communication devices in association with position information of the remote location. 5
13. The apparatus of claim 12, wherein the controller is adapted to output a control signal to the remote location upon receiving a signal indicating that the position of one of the plurality of wireless communication devices is within a designated distance of the remote location. 10
14. The apparatus of claim 11, wherein the memory stores information identifying a plurality of wireless communication devices in association with position information of at least one of the plurality of remote locations. 15
15. The apparatus of claim 14, wherein the controller is adapted to output a control signal to one of the remote locations upon receiving a signal indicating that the position of an associated one of the plurality of wireless communication devices is within a designated distance of the one of the remote locations. 20
16. The apparatus of claim 1, wherein a telephone number identifies the remote location, and the controller is adapted to output the control signal using the telephone number of the remote location. 25
17. The apparatus of claim 16, wherein the controller is adapted to output the control signal to the remote location through telephone lines. 30
18. The apparatus of claim 16, wherein the controller is adapted to output the control signal to the remote location through wireless communication. 35
19. The apparatus of claim 1, wherein the stored information identifying the wireless communication device includes a telephone number. 40
20. The apparatus of claim 1, wherein the control signal adapted to be output to the remote location identifies the action to be initiated. 45
21. The apparatus of claim 1, wherein the control signal adapted to be output to the remote location does not identify the action to be initiated, the action being variable at the remote location. 50
22. An apparatus comprising:
- a memory, adapted to store information identifying a wireless communication device and position information of a remote location stored in association with the information identifying the wireless communication device; and 55
- a controller, adapted to output a control signal to the remote location instructing initiation of an action at the remote location upon determining that a position of the wireless communication device has satisfied a geographic relationship with the remote location.
23. The apparatus of claim 22, wherein the position of the wireless communication device is determined at the controller through triangulation.
24. The apparatus of claim 22, wherein the geographic relationship is satisfied when the position of the wireless communication device is within a designated distance of the remote location.
25. A system, comprising:
- a first controller, adapted to receive information indicating position of a wireless communication device;
- a memory adapted to store information identifying the wireless communication device and position information of a remote location stored in association with the information identifying the wireless communication device; and
- a second controller, located at the remote location, adapted to initiate an action at the remote location upon receiving a control signal from the first controller, the first controller adapted to send the control signal to the second controller upon receiving a signal indicating that the position of the wireless communication device has satisfied a geographical relationship with the remote location.
26. The system of claim 25, wherein the geographic relationship is satisfied when the position of the wireless communication device is within a designated distance of the remote location.
27. The system of claim 25, wherein the second controller, upon receiving the control signal from the first controller, is adapted to initiate the action by outputting a signal to a device at the remote location.
28. The system of claim 27, wherein the second controller is adapted to output the signal to open/close a door at the remote location.
29. The system of claim 27, wherein the second controller is adapted to output the signal to adjust environmental conditions at the remote location.
30. The system of claim 25, wherein the second con-

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troller, upon receiving the control signal from the first controller, is adapted to initiate the action by performing a programmed task.

31. The system of claim 30, wherein the programmed task is adjustable at the second controller.

32. The system of claim 30, wherein a parameter of the programmed task is adjustable at the second controller.

33. The system of claim 30, wherein the programmed task includes sorting email.

34. The system of claim 25, wherein the first controller is adapted to compare position information of the wireless communication device to stored position information of remote location and is adapted to determine when the wireless communication device has satisfied the geographic relationship based upon the comparison.

35. The system of claim 25, wherein the wireless communication device is a wireless phone.

36. The system of claim 25, wherein the position information indicating position of the wireless communication device is received from a global positioning system (GPS) within the wireless communication device.

37. The system of claim 25, wherein the position information indicating position of the wireless communication device is received from an assisted global positioning system (assisted GPS).

38. The system of claim 25, wherein the memory stores position information of a plurality of remote locations in association with the information identifying a wireless communication device.

39. The system of claim 38, wherein the first controller is adapted to output a control signal to one of the plurality of remote locations upon receiving information indicating that the position of the wireless communication device is within a designated distance of the one of the plurality of the remote locations.

40. The system of claim 25, wherein the memory stores information identifying a plurality of wireless communication devices in association with position information of the remote location.

41. The system of claim 40, wherein the first controller is adapted to output a signal to the remote location upon receiving a signal indicating that the position of one of the plurality of wireless communication devices is within a designated distance of the remote

location.

42. The system of claim 39, wherein the memory stores information identifying a plurality of wireless communication devices in association with position information of at least one of the plurality of remote locations.

43. The system of claim 42, wherein the first controller is adapted to output a control signal to one of the remote locations upon receiving a signal indicating that the position of an associated one of the plurality of wireless communication devices is within a designated distance of the one of the remote locations.

44. The system of claim 25, wherein a telephone number identifies the remote location, and the controller is adapted to output the control signal using the telephone number of the remote location.

45. The system of claim 44, wherein the first controller is adapted to output the control signal to the second controller at the remote location through telephone lines.

46. The system of claim 44, wherein the first controller is adapted to output the control signal to the second controller at the remote location through wireless communication.

47. The system of claim 25, wherein the stored information identifying the wireless communication device includes a telephone number.

48. A method, comprising:

storing position information of a remote location in association with information identifying a wireless communication device;

receiving information indicating a position of the wireless device; and

outputting a control signal to the remote location instructing initiation of an action upon the received information indicating that the position of the wireless communication has satisfied a geographic relationship with the remote location.

49. The method of claim 48, wherein the geographic relationship is satisfied when the wireless communication device is within a designated distance of the remote location.

50. The method of claim 48, further comprising: comparing the received position information of the wireless communication device to the stored

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position information of the remote location and outputting the control signal based upon the comparison.

51. The method of claim 48, wherein the information indicating position is received from a wireless phone.

52. The method of claim 48, wherein the action initiated at the remote location includes operating a door.

53. The method of claim 48, wherein the action initiated at the remote location includes adjusting environmental conditions at the remote location.

54. The method of claim 48, wherein the action initiated at the remote location includes sorting email.

55. The method of claim 48, wherein storing includes storing position information of a plurality of remote locations in association with information identifying a wireless communication device.

56. The method of claim 55, wherein outputting includes outputting a control signal to one of the plurality of remote locations upon receiving information indicating that the position of the wireless communication device is within a designated distance of the one of the plurality of the remote locations.

57. The method of claim 48, wherein the information identifying a wireless communication device includes a telephone number.

58. The method of claim 48, wherein a telephone number of the remote location is stored in association with the position information and information identifying the wireless communication device.

59. The method of claim 58, wherein the control signal is output to the remote location through telephone lines.

60. The method of claim 58, wherein the control signal is output to the remote location through wireless communication.

61. The method of claim 48, further comprising: initiating the action at the remote location upon receiving the output control signal.

62. The method of claim 48, further comprising: outputting a signal to a controller to operate a door at the remote location upon receiving the output control signal.

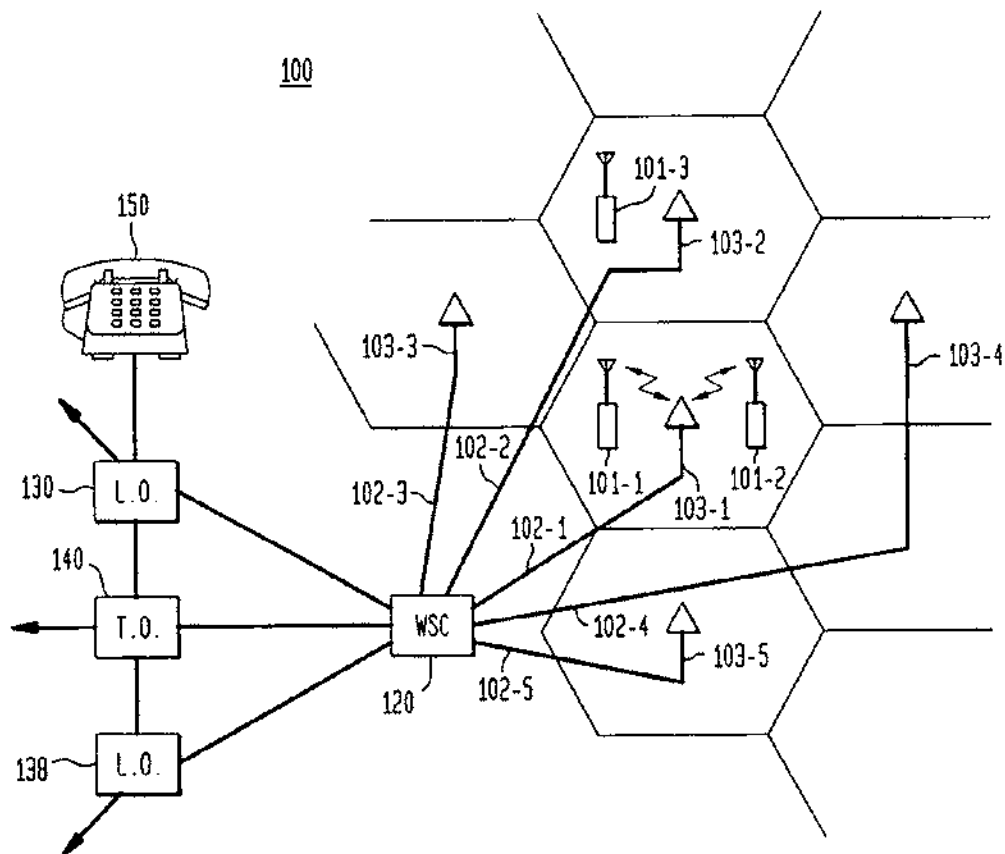
63. The method of claim 48, further comprising: outputting a signal to a control device to adjust environmental conditions at the remote location upon

on receiving the output control signal.

64. The method of claim 48, further comprising: sorting email at the remote location upon receiving the output control signal.

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FIG. 1
(PRIOR ART)



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FIG. 2

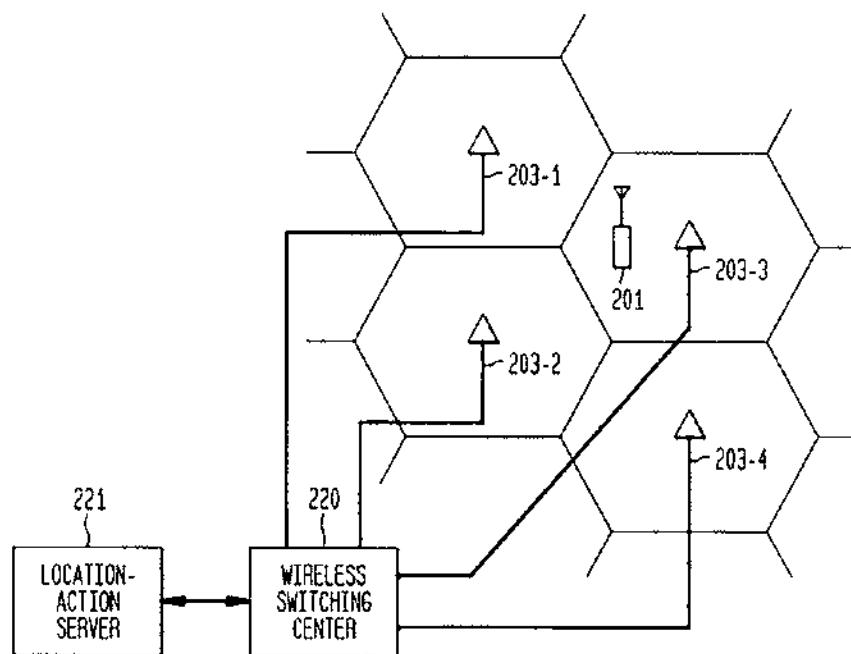
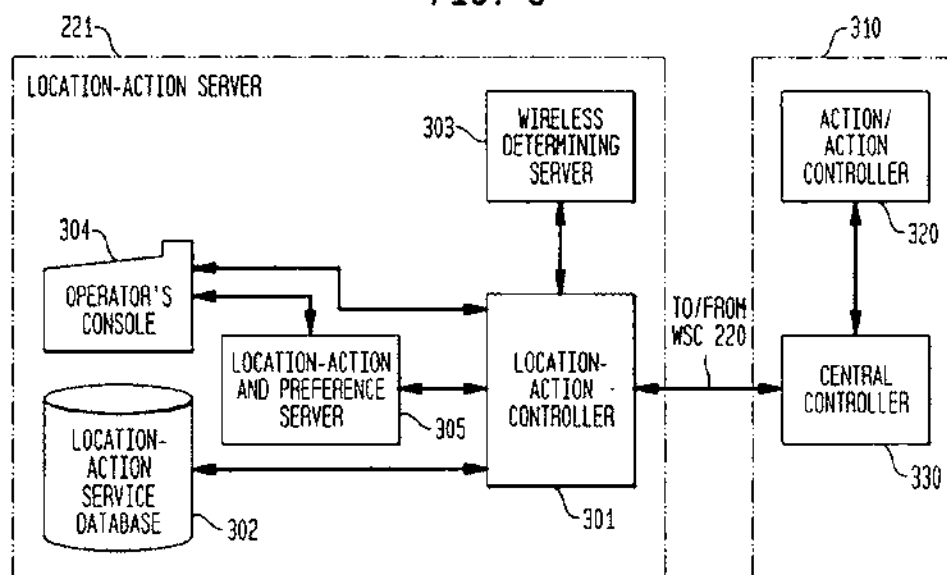


FIG. 3



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FIG. 4A

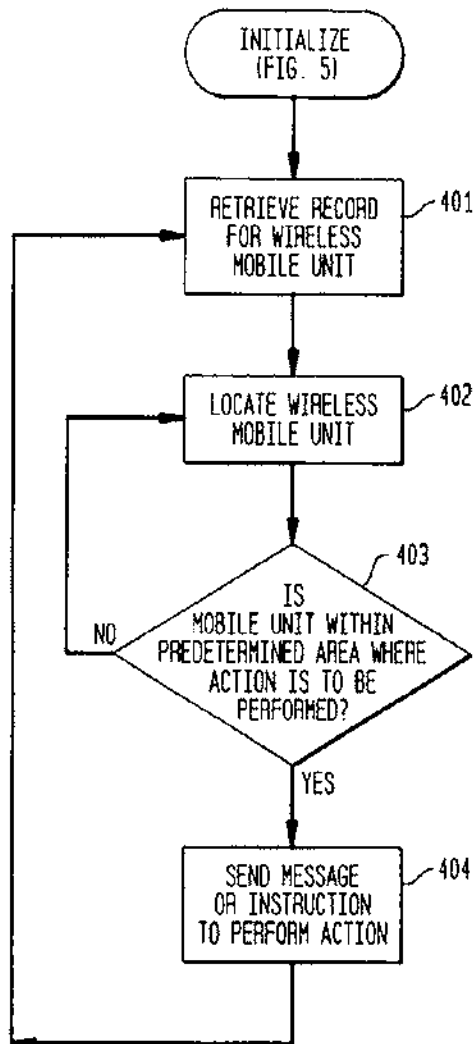
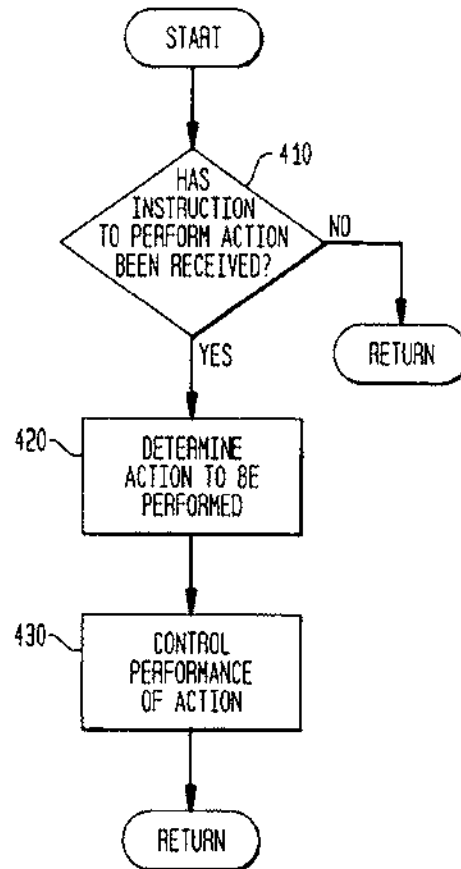


FIG. 4B



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FIG. 5

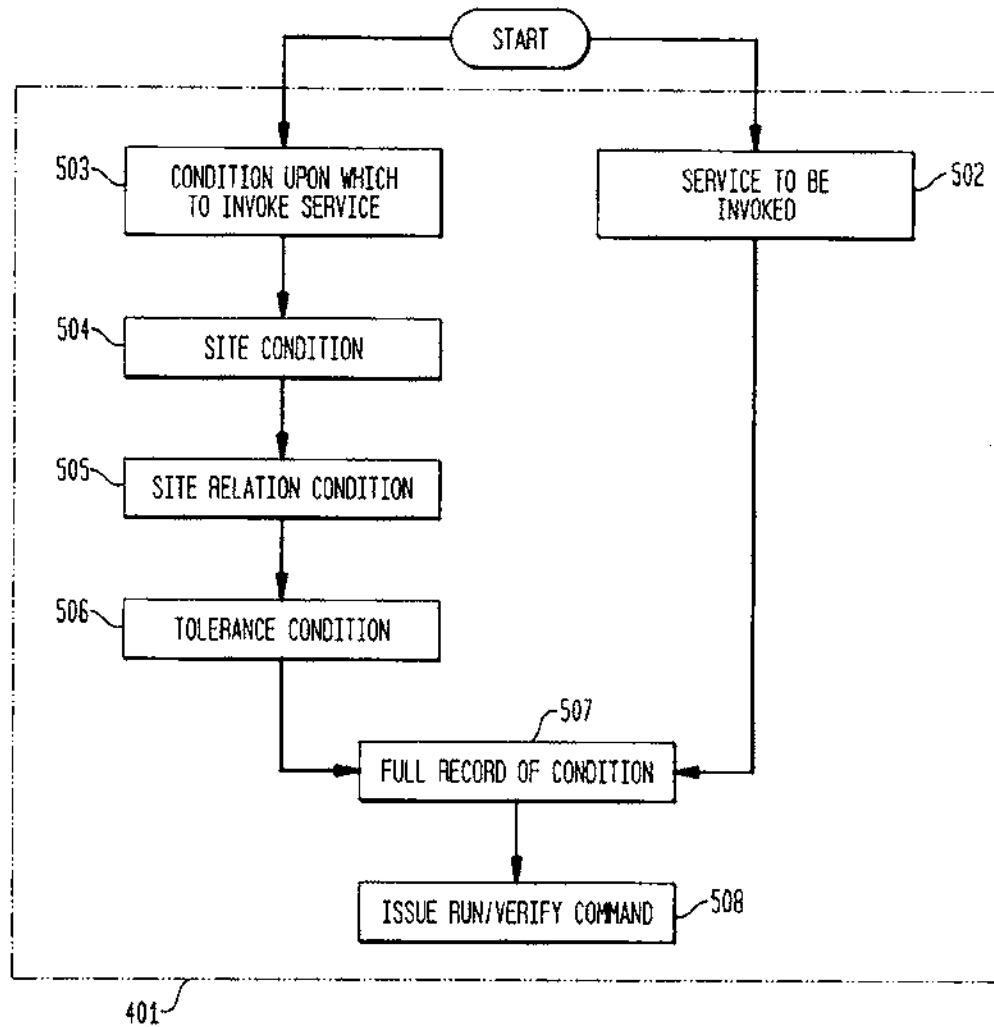
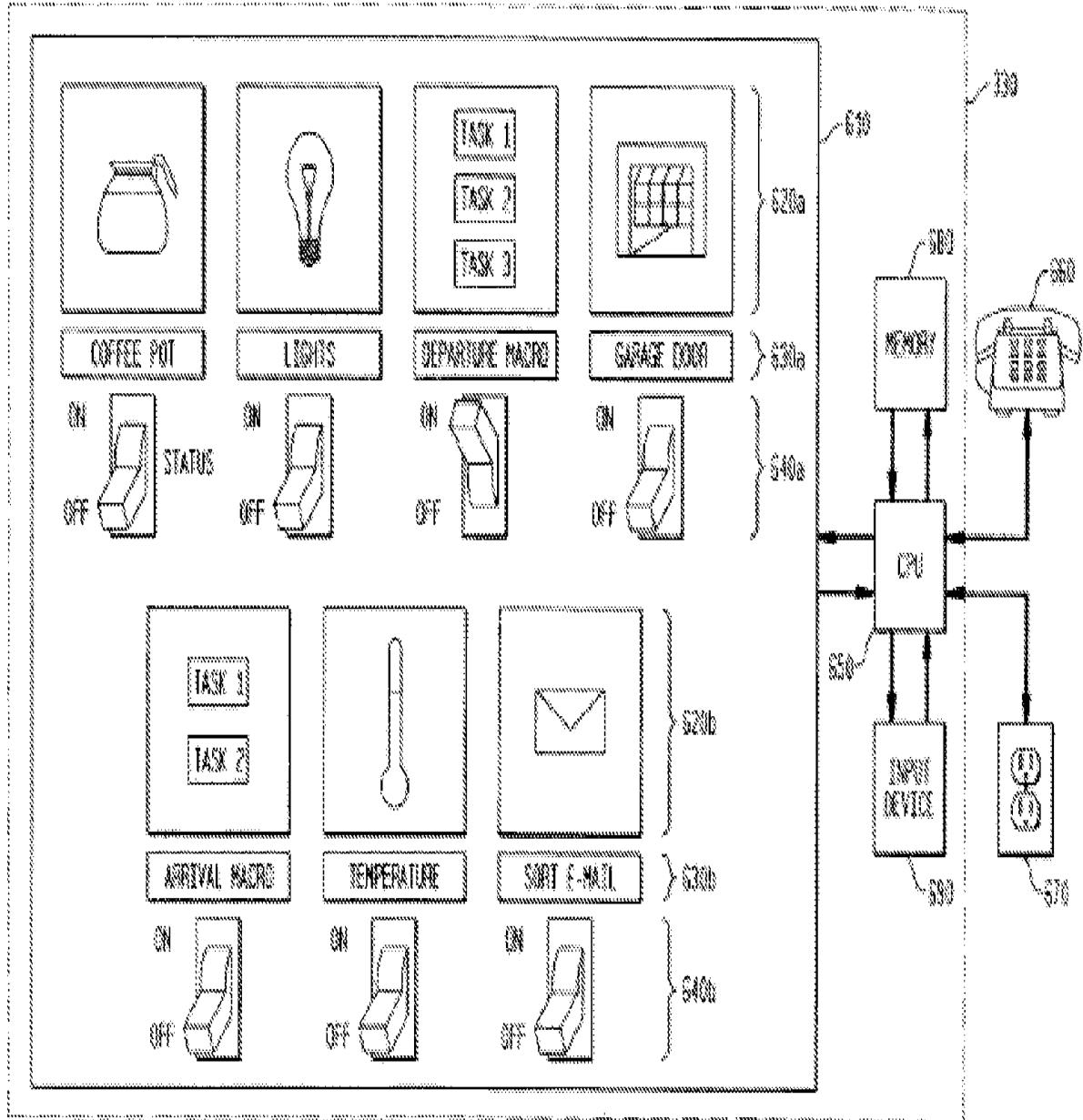


FIG. 6



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FIG. 7A

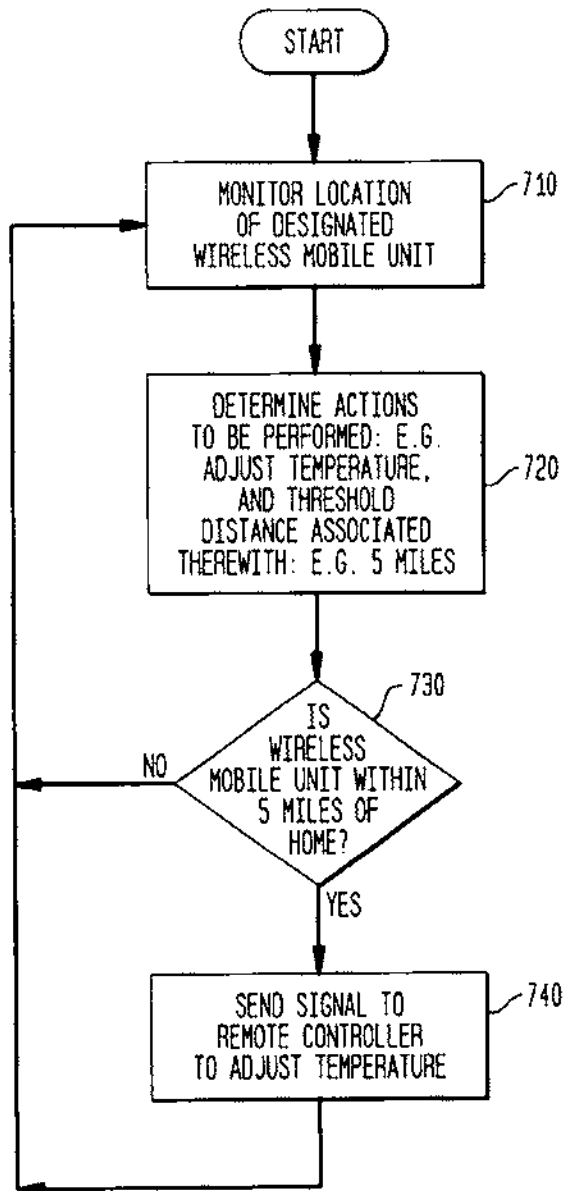
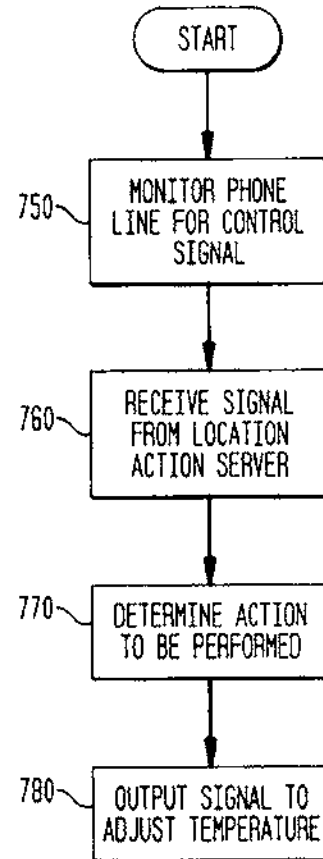


FIG. 7B



(19)



(11)

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(12)

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(72) Inventors:

- * NIKOVSKI, Daniel
Brookline, MA 02446 (US)
- * Laughman, Christopher
Waltham, MA 02461 (US)

(74) Representative: Pfenning, Meinig & Partner GbR

 Patent- und Rechtsanwälte
 Theresienhöhe 13
 80339 München (DE)

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 (71) Applicant: Mitsubishi Electric Corporation
 Tokyo 100-8310 (JP)

(54) Method for controlling a heating, ventilation, and air conditioning (HVAC) system

(57) A method controls a heating, ventilation, and air conditioning (HVAC) system by determining a travel time from a mobile site to a fixed site, and determining a conditioning time for a HVAC system at the fixed site. The

HVAC is maintained in an ON state if the travel time is less than the conditioning time, and otherwise maintaining the HVAC in an OFF state, and wherein the conditioning time is determined using a building thermal model.

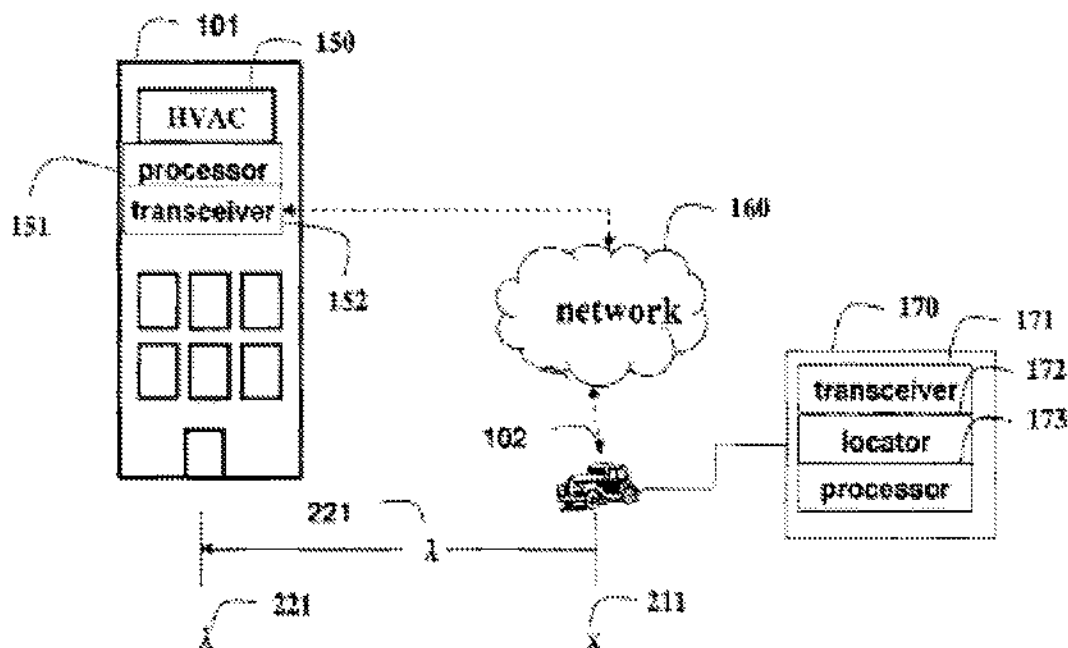


Figure 1

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Description**Field of the Invention**

[0001] The invention relates generally to the field of heating, ventilation, and air conditioning (HVAC) systems, and more particularly to energy saving programmable HVAC systems.

Background of the Invention

[0002] Heating, ventilation, and air conditioning (HVAC) systems consume a large amount of energy. Commonly, heating and cooling operations for an environment are controlled automatically with one or more thermostats. A thermostat can be located centrally, or thermostats can be distributed. Typically, the operation of the HVAC system is according to preset temperature limits.

[0003] Because many environments may be unoccupied at times, this wastes energy. Occupancy can be determined with motion detectors. However, the time required to heat or cool the environment to the desirable temperature takes considerable time, perhaps longer than the time that the environment is occupied.

[0004] An operation schedule can be used. However, this is impractical when the occupancy period is irregular, or the schedule changes frequently. Schedules also do not accommodate holidays, vacations, travel, unplanned absence, and other changes to the occupancy routine. Thus, the schedule is only a best guess of occupancy.

[0005] One system augments manual and programmable home thermostats by using just-in-time heating and cooling based on travel-to-home distance obtained from location-aware mobile phones, Gupta et al., "Adding GPS-Control to Traditional Thermostats: An Exploration of Potential Energy Savings and Design Challenges," Book Pervasive Computing, Volume 5538/2009, pp. 95-114, May 2009. The system starts heating or cooling an inhabitable space only when the time necessary for the space's occupant to reach that space becomes lower than the time it would take to bring the space to a comfortable temperature.

[0006] That system used a GPS-enabled device such as a telephone to determine a user's current location, and a publicly available mapping system (MapQuest) to compute the time to reach the space to be conditioned from the user's current location.

[0007] In order to compute the time necessary to bring the space to a comfortable temperature, that system uses empirical data stored in heating/cooling look-up tables. For a given combination of indoor and outdoor temperature, the table stores the time it would take to heat or cool the space to a comfortable temperature. Each table is specific to the heating/cooling system type installed at the particular location. That system lacks generalization, because the tables must be individually constructed for each residence from measurements. Furthermore, the

observed data from a limited time period typically would not include all possible combinations of indoor and outdoor temperatures that might be encountered in the future.

[0008] Another disadvantage of that system is the need to constantly re-compute and compare the travel time and conditioning time. Since the GPS-enabled mobile device is typically powered by a battery, constant communication between the device and the conditioned space would quickly drain the mobile device's battery, and is also likely to result in costly data communications traffic.

Summary of the Invention

[0009] A method controls a heating, ventilation, air conditioning (HVAC) system by determining a travel time from a mobile site to a fixed site, and determining a conditioning time for a HVAC system at the fixed site based on pre-computed building thermal models.

[0010] The HVAC is maintained in an ON state if the travel time is less than the conditioning time, and otherwise maintaining the HVAC in an OFF state, and wherein the conditioning time is determined using a building thermal model.

[0011] The mobile device carried by the spaces occupant and the building HVAC system installed at the conditioned space communicate according to a protocol that results in minimal data traffic.

Brief Description of the Drawings**[0012]**

Figure 1 is a schematic of a system for controlling a HVAC system according to embodiments of the invention;

Figure 2A is a flow diagram for controlling a HVAC system according to embodiments of the invention;

Figure 2B is a state transition diagram for controlling the HVAC system according to embodiments of the invention;

Figure 3 is a table of conditional logic used by embodiments of the invention; and

Figures 4A-4B are graphs of environmental conditions as a function of travel time.

Detailed Description of the Preferred Embodiment

[0013] The embodiments of our invention provide a method for operating a heating, ventilation, and air conditioning (HVAC) system. The method uses a travel time for a person to reach the environment being controlled, and the conditioning time of the HVAC system.

[0014] Figure 1 shows a fixed site (a workplace) 101, and a mobile site 102 at a location x 211, e.g., the mobile site is traveling to the fixed site. The mobile site includes a person destined for the fixed site. The mobile site can be a car, public transportation, a bicycle, or a person carrying a mobile communications device 170. The device 170 includes a mobile transceiver 171, a mobile locator 172, and a mobile processor 173.

[0015] The fixed site 101 includes a HVAC system 150, which is connected to a fixed processor 151 and a fixed transceiver 152 similar to the mobile transceiver 171. In a simplest form, the HVAC system includes a boiler, and perhaps air circulation means.

[0016] The fixed site and the mobile site can communicate with each other via a network 160, e.g., the Internet, using the transceivers 152 and 171.

[0017] The travel time λ 221 for the mobile site to arrive at the fixed site 101 can be estimated from the locations x 211 of the mobile site 102. The locations can be sensed using the locator 172, e.g. a global positioning system (GPS), or a mobile communication device, e.g., mobile telephone in the vehicle, and the location of the mobile site is provided by a mobile telephone service provider. The locator can also be a Bluetooth device communicating with a fixed-location Bluetooth beacon. The travel time can also consider traffic and weather conditions between the mobile and fixed sites, as available via the network.

[0018] As shown in Fig. 2A, the fixed site estimates 230 the conditioning time Θ 231 from environmental conditions 229 and a building thermal model 228. The environmental conditions can include the external temperature and direct sunlight illumination at the fixed site. It is assumed these are constant or slowly varying, and if not, they can be adjusted for diurnal and annual variations, and according to weather forecasts, also readily available via the network.

[0019] The building thermal model 228 represents the thermal response of the building to the environmental conditions (e.g., external temperature, sunlight) and the operation of the HVAC system 150 that actively moves heat in or out of the building. A popular type of building thermal model is a grey-box model, where the building is modeled as a thermal circuit. The building thermal model can include factors such as thermal gain and transmission through windows, convection and conduction, shading and insulation. The building thermal model tracks the state of the building continuously and for any amount of heat supplied by the HVAC system 150, and can predict the future evolution of the internal temperature of the building. In order to compute the conditioning time Θ 231, the building thermal model is used to determine the future evolution of the internal temperature for the case when the HVAC system 150 is operated at full power. The time necessary for the internal temperature to reach a comfortable threshold, e.g. 70F, is determined to be the conditioning time Θ 231.

[0020] A difference 240 between the travel time 221

and the conditioning time 231 is then used to determine how the operation 250 of the HVAC system 150 is maintained.

[0021] As shown in Figure 2B, the HVAC is maintained in an OFF state 261 until the conditioning time constraint 262 is satisfied. Then, the HVAC is maintained in an ON state 263 until the conditioning time constraint 264 is satisfied. Namely, the HVAC is maintained in an ON state if the travel time is less than the conditioning time, and otherwise the HVAC is maintained in an OFF state. The travel time 221 is based on probabilistic information obtained from previous traveling patterns, considering the mode of travel, the time of day, the date and the day of the week. The travel time can also be based on schedules of public transportation. The travel time can be determined at either the fixed or mobile location. The travel time can be periodically transmitted, or either the fixed or the mobile site can initiate the communication of the travel time explicitly.

[0022] Figure 2A shows our method. The location x 211 of the mobile site is periodically sensed 210. The locations can be used to estimate 220 the travel time λ 221 to the fixed site. A threshold time ϵ 239 can be used to avoid rapid transitions between the ON and OFF states, which decreases efficiency.

[0023] Figure 3 shows the logic used by an embodiment of our invention to schedule communication between the fixed and mobile sites. In this embodiment, there is no regularly scheduled communication, either the fixed or mobile site can initiate a communication. Figure 3 shows the currently maintained states 301 of the HVAC system, the sites 302, and the constraints 303 based on the travel time λ , the conditioning time Θ and the threshold time ϵ .

[0024] Whenever there is a communication between the sites, the mobile site communicates the travel time λ 221 to the fixed site, and the fixed site communicates the conditioning time Θ 231, and the currently maintained state 301 of the HVAC system to the mobile site. The fixed site stores λ and the mobile site stores Θ . For each current state 301 of the HVAC, a communication is initiated by the site 302, when the constraint 303 becomes true for the corresponding state of the HVAC system.

[0025] As shown respectively in Figures 4A and 4B, it should be noted that when the HVAC system is ON, the system can operate in various modes. For example, if the travel is relatively large, then the HVAC can condition the environment slowly over a long period. That is the output of the HVAC system 'ramps-up' slowly. This minimizes energy consumption. If the travel time changes, the conditioning time can change accordingly. If the travel time is short, the HVAC might need to operate at maximum capacity to reach the desired internal environment condition. That is, the conditioning time is approximately proportional to the travel time.

Thus, in one embodiment, the travel time from the mobile site to the fixed site is determined, and an operation of the HVAC system is set according to the travel time.

[0026] In another embodiment, multiple instances of the method can collaborate to minimize communications by the mobile site. For example, the person associated with the mobile site can be at the fixed workplace site and a fixed residence. In this case, the travel time and condition time can be determined for each sites, depending on whether the person is going to work, or coming home.

[0027] The HVAC system can be for an environment that can be occupied by multiple individuals. In this case, the travel time, conditioning time, and conditional logic are determined for each individual, and the HVAC is maintained in the ON state when any one condition indicates that this should be the case, and in the OFF state when all conditions indicate that this should not be the case.

[0028] In the case wherein N individuals share the same environment, but have different preferences for the environmental condition, the fixed site can calculate a separate Θ for each occupant ($\Theta_1, \Theta_2, \Theta_3 \dots \Theta_N$), and

each mobile site can communicate a separate $\lambda, \mathbf{l}, \epsilon$, ($\lambda_1, \lambda_2, \lambda_3, \dots, \lambda_N$). Furthermore, the HVAC system can use a separate threshold time ϵ for each occupant ($\epsilon_1, \epsilon_2, \epsilon_3 \dots \epsilon_N$). The HVAC transitions to the ON state when any of the conditioning times ($\Theta_1, \Theta_2, \Theta_3 \dots \Theta_N$) is greater than its corresponding travel time ($\lambda_1, \lambda_2, \lambda_3, \dots, \lambda_N$). The HVAC transitions to the OFF state when Θ_N plus a threshold time ϵ_N is less than the travel time λ_N for all corresponding Ns.

[0029] It should be noted that the method can also be used for other equipment, e.g., lighting, in which case $\Theta=0$, boilers, coffee makers, and water coolers. For desktop computers, the conditioning time is the time required to activate the computer, and Θ is a constant.

[0030] Thus, in the general case, the system is any equipment in or for an environment that needs to be maintained in an ON state when individuals are in the environment, and in an OFF state when the environment is unoccupied. The system is most effective at saving energy when the conditioning time is significantly greater than zero, so that the system can assure the comfort of occupants by starting to condition the space significantly before the occupants arrive, but at the same time is less than the travel time of the occupants for long periods, so that it can safely conserve energy during such periods.

[0031] Although the invention has been described by way of examples of preferred embodiments, it is to be understood that various other adaptations and modifications may be made within the spirit and scope of the invention. Therefore, it is the object of the appended claims to cover all such variations and modifications as come within the true spirit and scope of the invention.

Claims

1. A method for controlling a heating, ventilation, and air conditioning (HVAC) system, comprising the steps:

determining a travel time from a mobile site to a fixed site;
determining a conditioning time for a HVAC system at the fixed site; and
maintaining the HVAC in an ON state if the travel time is less than the conditioning time, and otherwise maintaining the HVAC in an OFF state, wherein the conditioning time is determined using a building thermal model, and wherein the steps are performed in a processor.

2. The method of claim 1, wherein the conditioning time includes a threshold time.

3. The method of claim 1, wherein the mobile site includes a mobile transceiver and a mobile locator; and wherein the fixed site includes a fixed transceiver; and wherein the processor includes a fixed processor at the fixed site and a mobile processor at the mobile site.

4. The method of claim 1, wherein the fixed site and the mobile site communicate via a network.

5. The method of claim 3, wherein the mobile locator is a global positioning system.

6. The method of claim 3, wherein the mobile locator is a Bluetooth device communicating with a fixed-location Bluetooth beacon.

7. The method of claim 3, wherein the mobile locator is a mobile telephone, and a location of the mobile site is provided by a mobile telephone service provider.

8. The method of claim 1, wherein the travel time is determined from locations of the mobile site.

9. The method of claim 1, wherein the travel time depends on traffic and weather conditions.

10. The method of claim 1, wherein the travel time is based on probabilistic information obtained from previous traveling patterns, and considers a mode of travel, time of day, date, and day of week.

11. The method of claim 1, wherein the travel time is determined based on schedules of public transportation.

12. The method of claim 1, wherein the travel time is

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- determined at either the fixed site or the mobile site.
13. The method of claim 1, wherein the travel time is transmitted to the fixed site periodically.
14. The method of claim 1, wherein the travel time is transmitted at a request by either the fixed site or the mobile site.
15. The method of claim 1, wherein the conditioning time is constant.
16. The method of claim 1, wherein the conditioning time is adjusted for diurnal and annual variations, and according to weather forecasts.
17. The method of claim 1, wherein the conditioning time is adjusted for internal environmental conditions at the fixed site.
18. The method of claim 1, wherein the conditioning time maximizes performance of the HVAC system.
19. The method of claim 1, wherein the mobile site and the fixed site communicate the travel time and the conditioning time only if any of the following constraints is true:
- HVAC is OFF, site is fixed, and $\Theta > \lambda$;
HVAC is OFF, site is mobile, and $\lambda < \Theta$;
HVAC is ON, site is fixed, and $\Theta < \lambda - \epsilon$;
HVAC is ON, site is mobile, and $\lambda > \Theta + \epsilon$;
- where λ is the travel time, Θ is the conditioning time, and ϵ is a threshold time.
20. The method of claim 1, where the conditioning time is approximately proportional to the travel time.
21. The method of claim 1, wherein there are N multiple mobile sites that each communicate travel times λ to the fixed site and the HVAC system turns ON when any of the travel times λ_N is less than the conditioning time Θ and turns OFF when all of the travel times λ_N are greater than the conditioning time Θ plus a threshold time ϵ .
22. The method of claim 21, in which the fixed site estimates a separate conditioning time Θ_N for each of N multiple mobile sites.
23. The method of claim 1, wherein the conditioning time is slowly varying.
24. The method of claim 1, wherein the model considers thermal gain and transmission through windows, convection and conduction, shading and insulation.
25. The method of claim 24, wherein the conditioning time satisfies a thermal property constraint.
26. A method for controlling a heating, ventilation, air conditioning (HVAC) system, comprising the steps:
- determining a travel time from a mobile site to a fixed site including a HVAC system; and
setting an operation of the HVAC system according to the travel time.

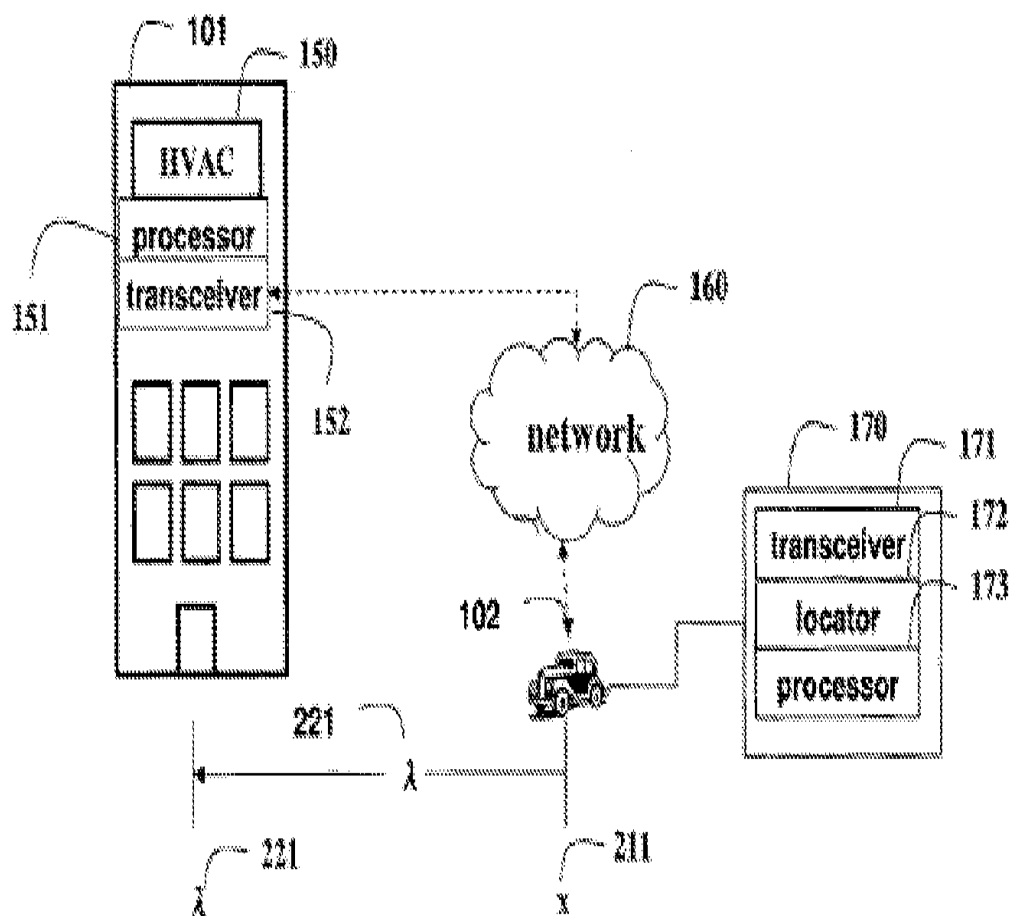


Figure 1

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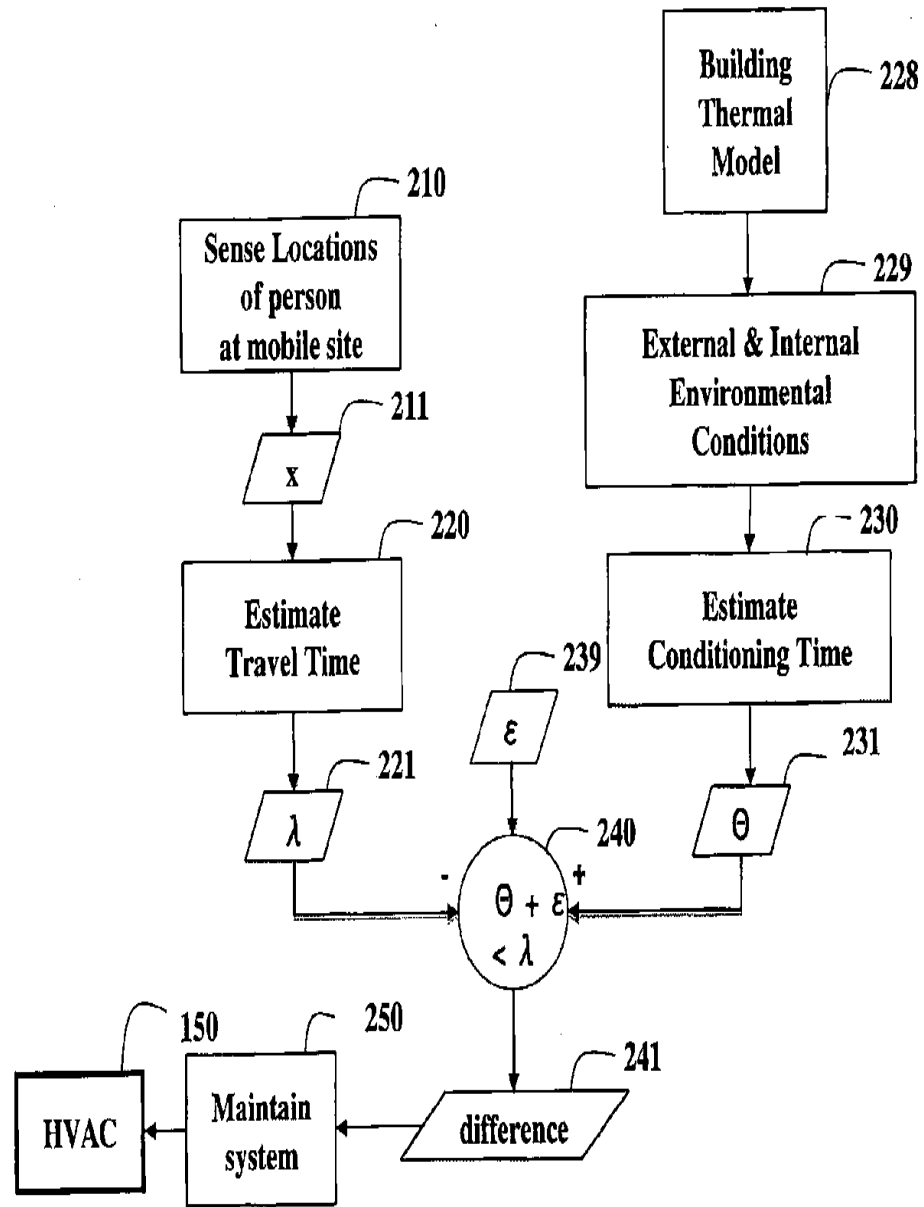


Figure 2A

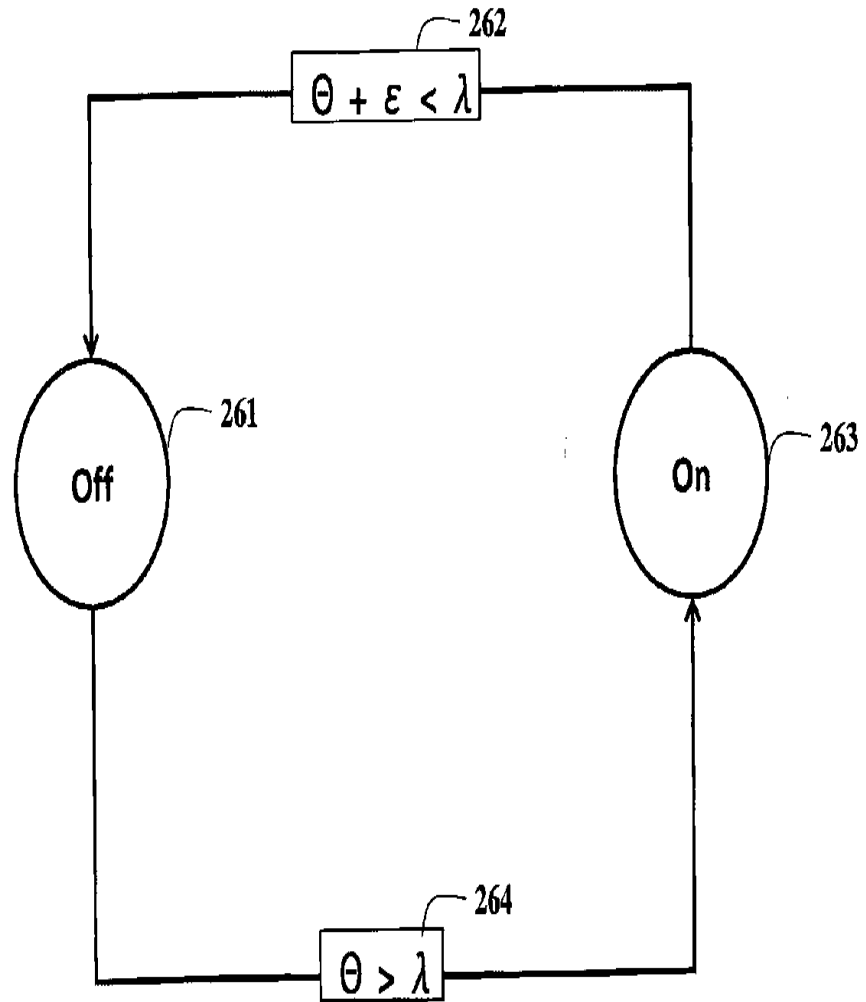


Figure 2B

Logic for Transmissions		
HVAC State	Site	Constraint
OFF	fixed	$\theta > \lambda$
OFF	mobile	$\lambda < \theta$
ON	fixed	$\theta < \lambda - \varepsilon$
ON	mobile	$\lambda > \theta + \varepsilon$

301 302 303

Figure 3

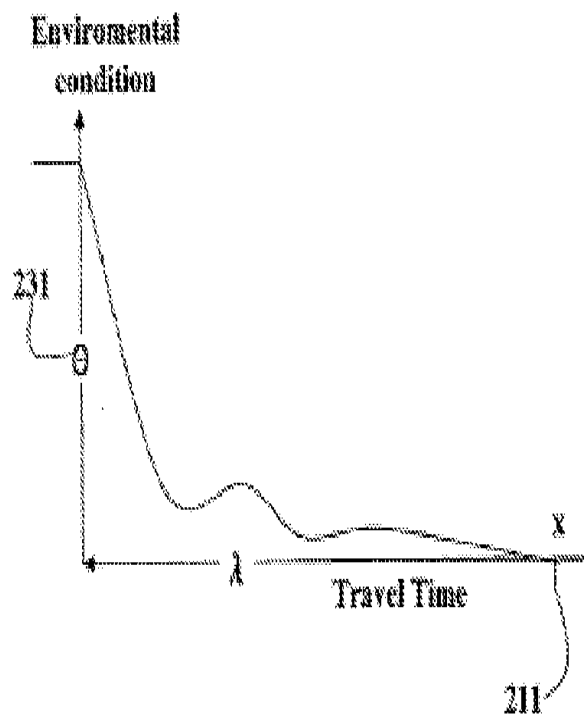


Figure 4A

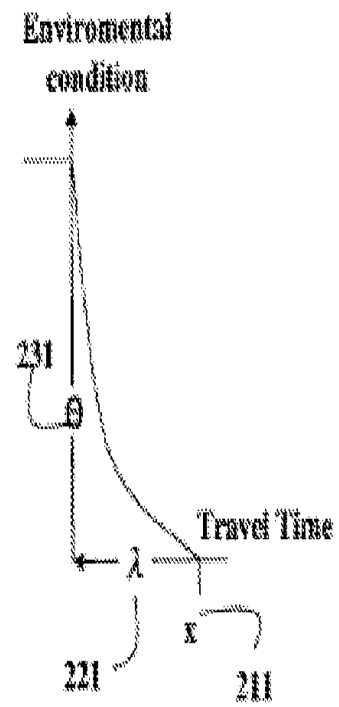


Figure 4B

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REFERENCES CITED IN THE DESCRIPTION

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- **GUPTA et al.** Adding GPS-Control to Traditional Thermostats: An Exploration of Potential Energy Savings and Design Challenges. *Book Pervasive Computing*, May 2009, 95-114 [0005]

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(71) Applicant:
James Ian Oswald
57 Coventry Road, Burbage, HINCKLEY,
Leicestershire, LE16 2HN, United Kingdom

Stephen John Tarnsett
8 Turville Close, Burbage, HINCKLEY,
Leicestershire, LE16 2GZ, United Kingdom

(72) Inventor(s):
James Ian Oswald
Stephen John Tarnsett

(74) Agent and/or Address for Service:
Serjants
25 The Crescent, King Street, LEICESTER,
LE1 6RN, United Kingdom

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F24F 11/00, G05B 13/04 // G06D 23/19, G06F 1/26

(52) UK CL. Edition X 1:
G06D 23/19, G06F 1/26

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(58) Field of Search:
UK CL. Edition X 1 G06D
Int. Cl.⁷ F24F, G05B, G06D, G06F
Other: ONLINE, WPI, EPDOC, JAPID.

(54) Abstract Title: Household energy management system

(57) A household energy management system uses measurements of the household electricity supply 4 to identify and to determine the energy consumption of individual household appliances. From these measurements, models can be built of the behaviour of the occupants of the house, the thermal properties of the house and the efficiency of the appliances. Using the models, the household appliances - in particular heating and cooling appliances - can be controlled to optimize energy efficiency; and maintenance programmes for the appliances and for the house itself can be recommended to the householder or arranged with a service company.

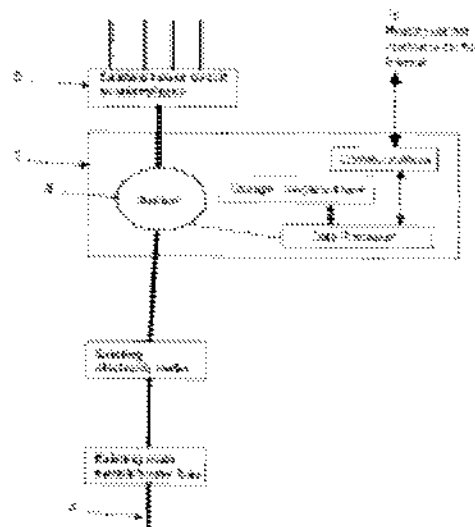


Figure 1

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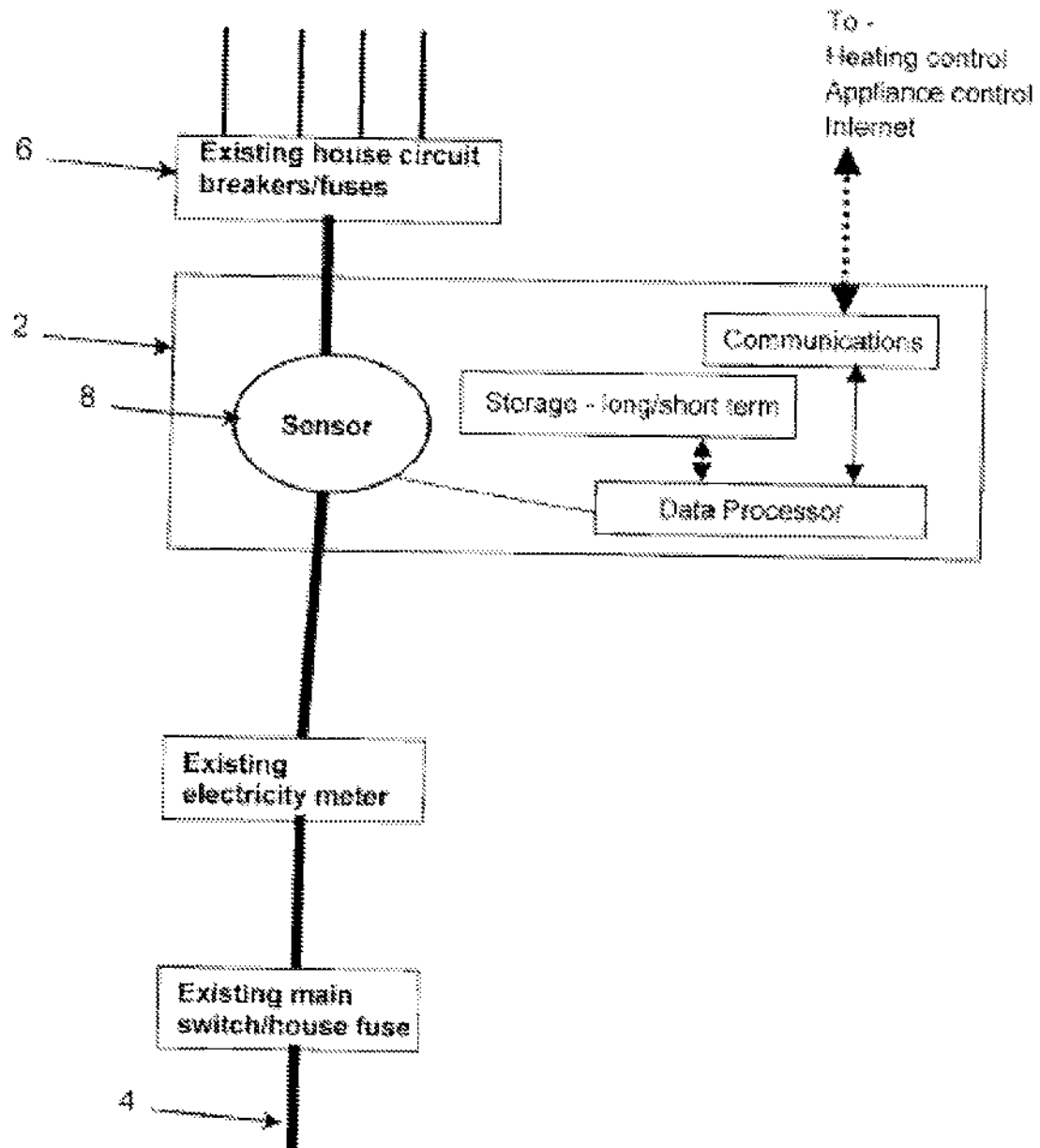


Figure 1

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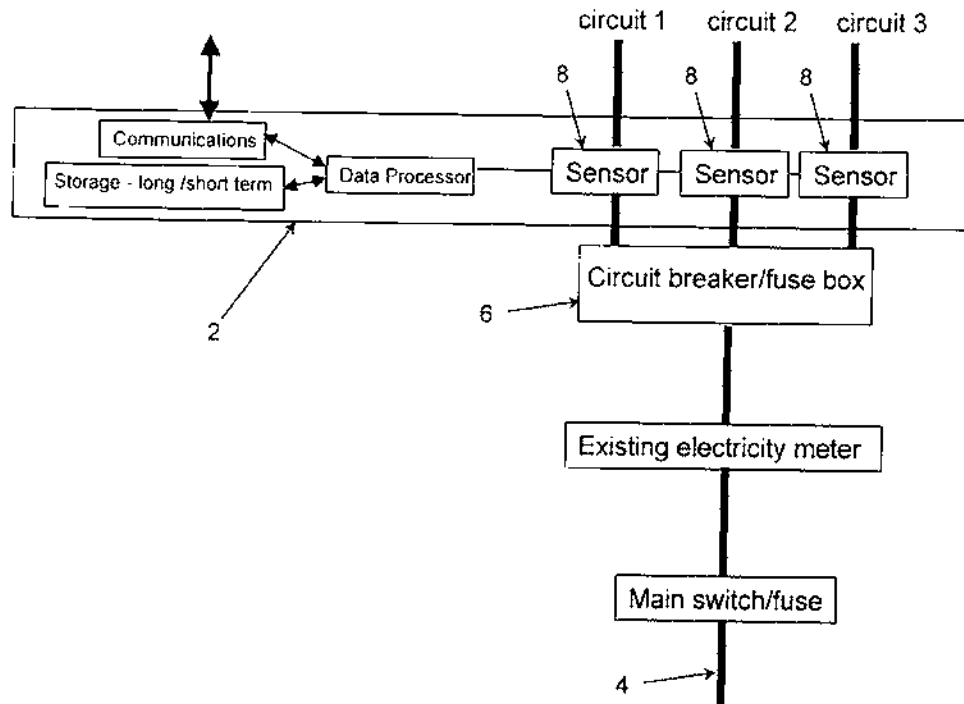


Figure 2

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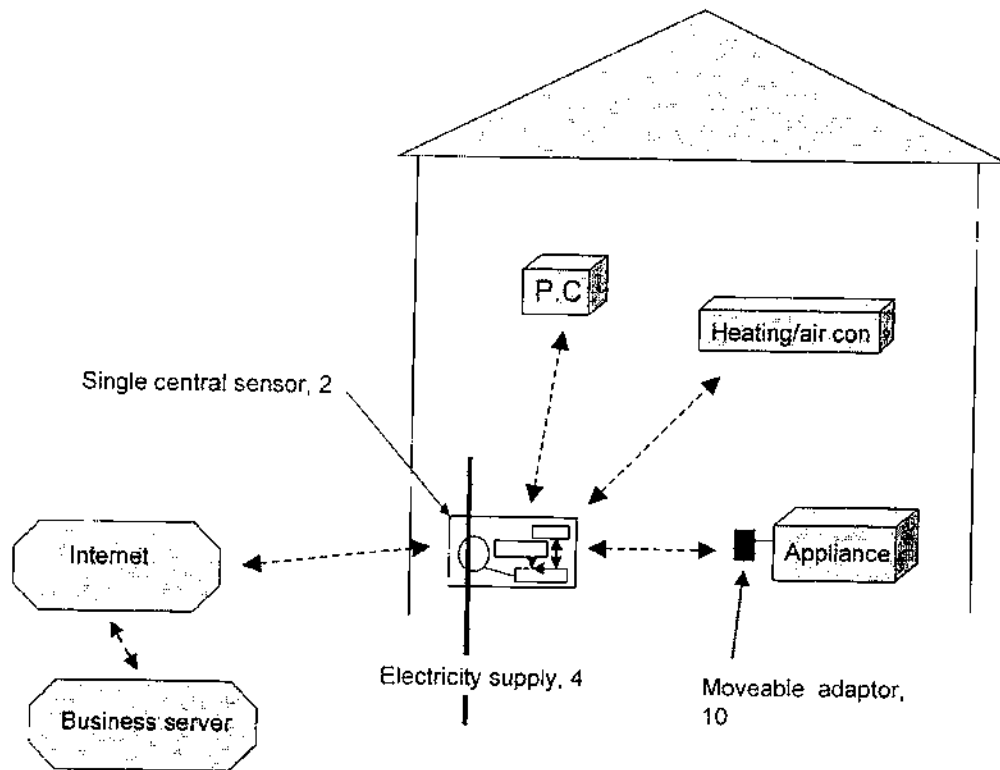


Figure 3

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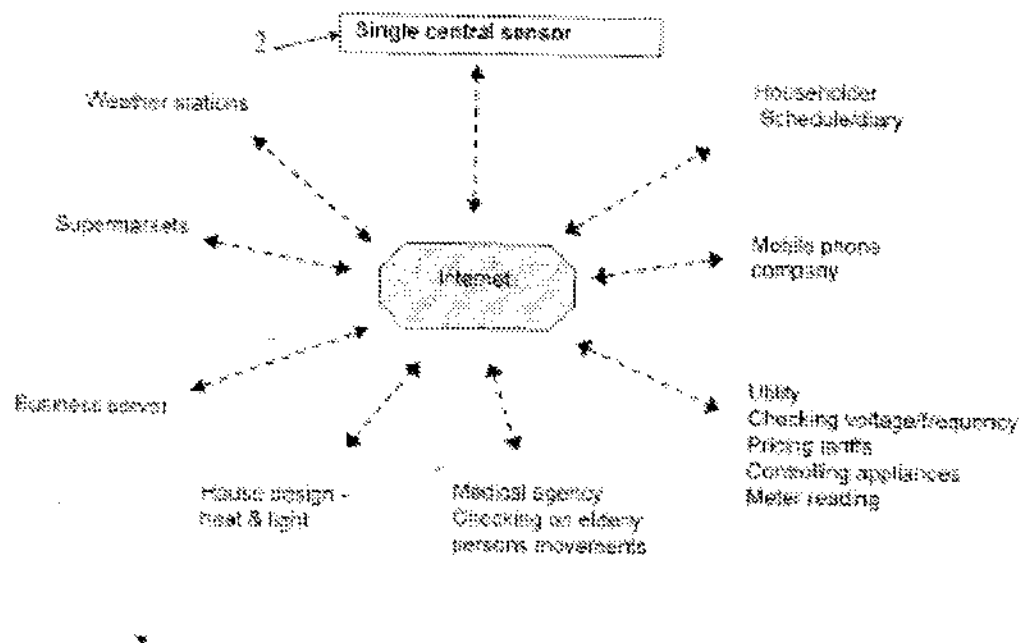


Figure 4

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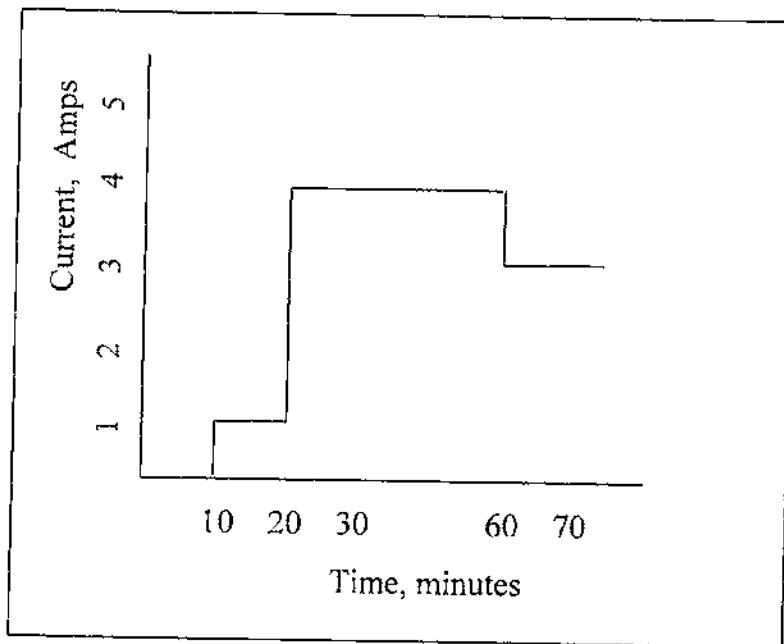


Figure 5

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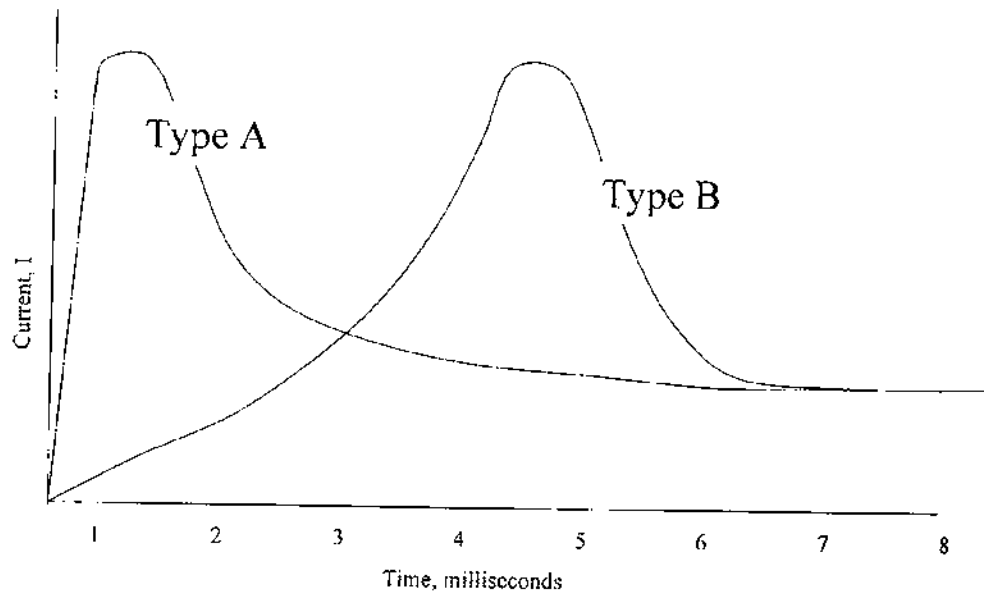


Figure 6

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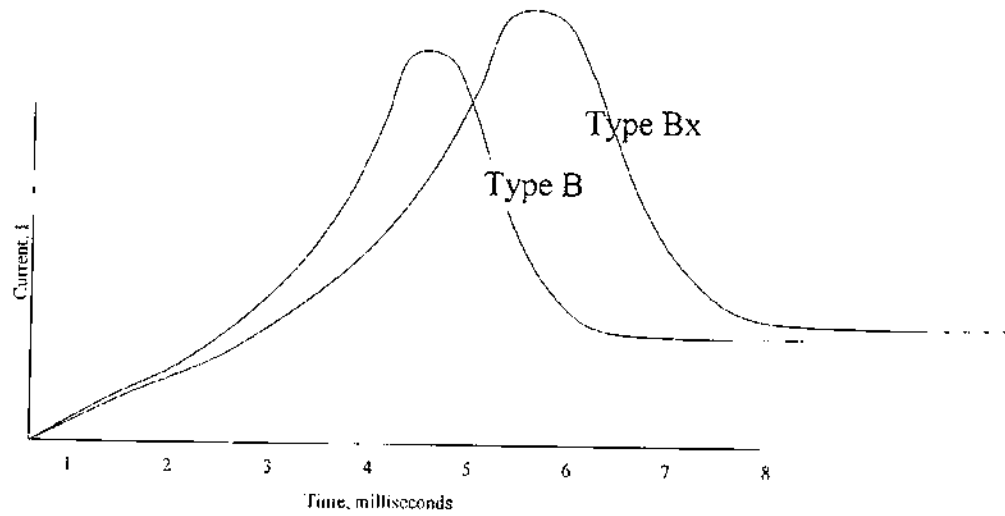


Figure 7

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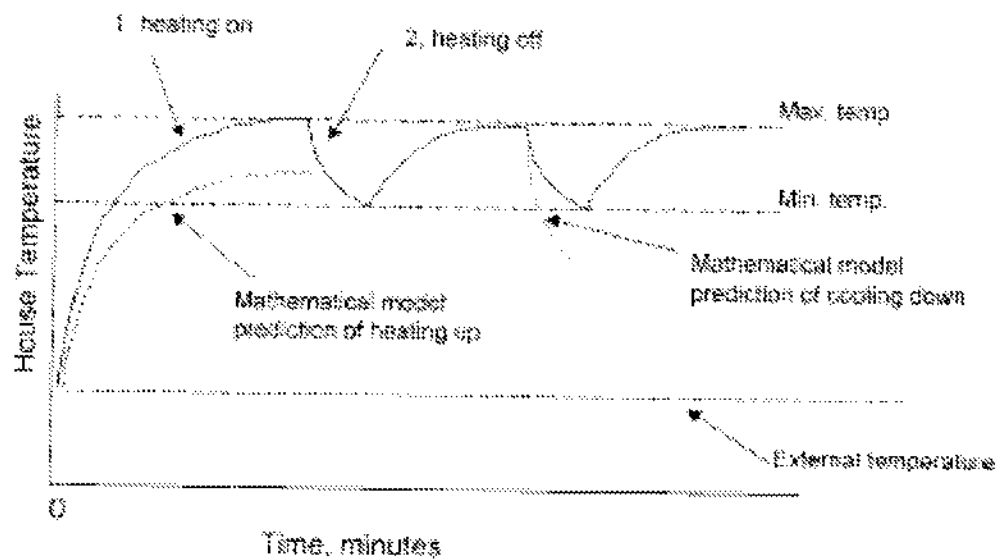


Figure 8

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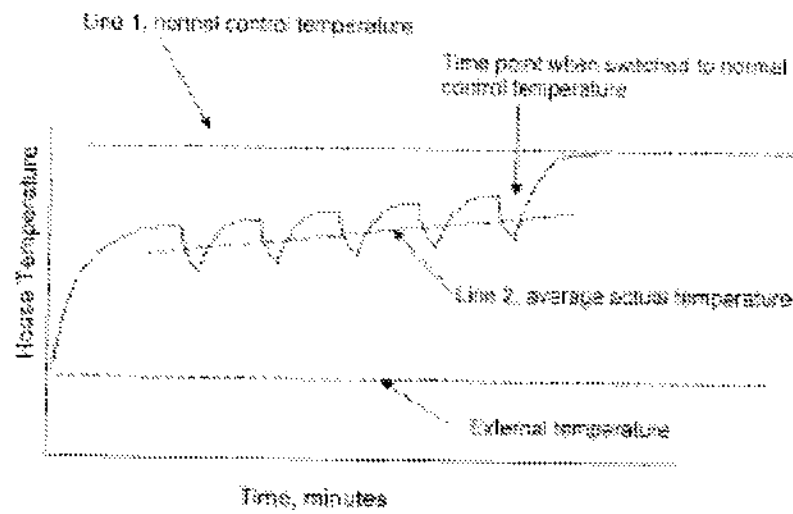


Figure 9

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TITLE

Household energy management system

DESCRIPTION

Technical field

The invention relates to the field of household energy management and in particular to ways in which the behaviour of the occupants of a house, the thermal properties of the house and the operation of household appliances can be measured and modelled, in order to control the household appliances in a certain way or to recommend courses of action to the users of the system such that energy use by the household is made more efficient.

Throughout this specification, the words “house” and “household” are used for convenience but those words are not to be interpreted as limiting the scope of the invention to the context of separate, domestic dwellings. Among other things, the word “house” is intended to include within its scope an apartment, an office, a hotel room or a part of any of the aforesaid.

Background of the invention

There have been a number of patents in this field in recent years, which describe new hardware solutions to achieving a computer/Internet-controlled house and provide improved control of the energy consumption in the household.

In general the prior art in the computer-controlled house control uses several electricity sensors (one per appliance/wall socket) to monitor the electrical activities in a house. This large number of additional devices is complicated and costly. By basing the system on a single sensor it would be more suitable for retrofitting to existing houses with existing appliances.

US patent 5572438 by Ehlers describes a house system, which uses a first and a second microcomputer to monitor and control the energy in the household. The patent mainly describes the hardware required to deliver the improvements – microcomputer, current

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sensors, appliance control and communication links to the outside world. The system requires a current sensor on each appliance. The hardware requirements for this system seem excessive and expensive to retrofit into an existing household.

US patent application 2003/0050737 by Osann describes another arrangement of hardware, which suggests changing all or several of the electrical wall sockets within the house. It includes suggestions of including video cameras, intercom, and motion detector and temperature sensor in each of these replacement wall outlets. This appears an excessive use of technology with an extensive requirement for hardware and installation work by skilled electricians. Many of these features will not be valued by householders who are happy to not have video cameras in the house. The main financial saving to the householder is through improved temperature control and the additional systems seem excessive. However, the patent application does describe (in claims 81 and 82) a method whereby all of the house electrical current changes can be monitored from a single location in or near the circuit breakers. This seems a much simpler and cheaper approach, which will suit retrofitting of existing houses. However, this idea can be used more effectively with further analytical/mathematical tools run on a computer and with additional moveable adaptors to which it can communicate, as described herein.

An electronic control system for a house is currently on sale from Honeywell Controls under the registered trade mark Hometronic. The system is described on their web site at http://content.honeywell.com/uk/press/hometronic_dayinthelife.htm. The Hometronic system uses a single central controller to determine on and off times for appliances and heating appliances around the house. It can connect to the Internet and be controlled via the web from anywhere in the world. However, it relies on one control device being attached to one appliance to provide on/off control and this makes it an expensive system to retrofit.

US patent 5115967 describes a mathematical method of predicting the transient thermal behaviour of a house climate control system (heating/cooling system).

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It is already known to use infrared sensors to determine occupancy in the house and to use this information to control house energy systems. An example of this is given in US patent 6324008.

US patent application 2002/0095269 discloses an appliance monitoring system, in which a subsystem incorporated in each appliance monitors parameters such as the number of cycles and the energy consumption of the appliance. In the event that the appliance needs attention, the system alerts the user or a service centre.

Microchip Technology Inc is a supplier of microchips. They have posted an article entitled "Microchip watt-hour Meter using PIC16C923 and CS5460" on their web site at <http://www.microchip.com/1010/suppdoc/appnote/all/an220/index.htm> on how to use one of their chips to make a watt hour meter. The power measurement integrated circuit CS5460 from Cirrus Logic/Crystal Power Measurement is used with the microcontroller PIC16C923 to make a power meter. The CS5460 measures the instantaneous voltage and current four thousand times a second and uses these measurements to compute instantaneous power, V_{RMS} , I_{RMS} and accumulated energy. Once the accumulated energy has increased by 10 Watt.seconds a pulse is generated at the output pin (EOUT pin) for counting by another device to form a consumption meter. The article explains how to use this device to record total power consumption.

Summary of the invention

In a first aspect, the invention provides a household energy management system comprising at least one sensing means, which measures energy use by occupants of the house; a modelling means, which uses the energy measurements from the sensing means to build a model of the behaviour of the occupants; and a control means, which controls the operation of one or more household appliances in the house on the basis of the model.

The modelling means may build a predictive model of the pattern of behaviour of the occupants over time, in which case the predictive model may be continually refined in response to new measurements by the sensing means.

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A model of the predicted behaviour of the occupants of a house allows more efficient use of the appliances in the house. For example, the predictive model may predict the times when the house will be occupied in order for the control means to control the operation of one or more household appliances, such as heating or cooling appliances, on the basis of the predicted times when the house will be occupied.

Additionally, or alternatively, the modelling means may build a temporary model of the current behaviour of the occupants.

A model of the current behaviour of the occupants of a house also allows more efficient use of the appliances in the house. For example, the temporary model may allow the control means to control the operation of heating or cooling appliances to achieve a desired temperature according to the current level of activity of the occupants.

The model of the behaviour of the occupants may include a determination of whether the house is occupied. To assist in this, the modelling means may have an interface with an intruder alarm system in the house and may receive signals indicative of the location of the occupants derived from, for example, a mobile phone network or a global positioning system. In a further enhancement, the modelling means can use the location signals to predict when the occupants may return to the house.

One application of the behaviour modelling means is to trigger an alert when an unexpected pattern of behaviour is detected. For example it may warn when an elderly person becomes immobile or when activity is detected in the house while the occupants are away.

Preferably, the sensing means measures electrical activity within the house. The sensing means may comprise a moveable sensor for location between an electricity supply outlet and an individual electrical appliance to measure the energy use by that appliance; or a fixed sensor on the household electricity supply to measure the respective energy uses of

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a plurality of electrical appliances connected to the supply. The optimum combination is one fixed sensor and a few moveable sensors, as described below.

In a second aspect, the invention provides a household energy management system, comprising one or more temperature sensors for measuring the temperature inside the house; a source of information about the temperature outside the house; a modelling means, which uses the inside and outside temperature measurements to derive a transient thermal model of the house, which can predict changes in the inside temperature on the basis of the information about the outside temperature; means for comparing the derived transient thermal model with a reference transient thermal model; and means for warning a user of the system when the derived model differs from the reference model by more than a predetermined limit.

The temperature sensor inside the house may be a thermostat or other temperature control device forming part of the household heating system; and it need not send temperature readings continuously to the household energy management system but may, for example, only inform the energy management system when the inside temperature has reached a value at which heating or cooling appliances are switched on or off.

The transient thermal model may additionally make use of information about the wind speed and/or humidity outside the house. As the source of the information about the outside temperature and/or wind speed and/or humidity, the system may comprise one or more sensors outside the house or it may comprise means for receiving broadcast weather information. The weather information may be broadcast as part of a radio or television signal or via a cable or telephone link or, preferably, over the Internet.

If the reference transient thermal model is a standard model for the type of house in which the system is installed, then the warning means can warn the user that the thermal properties of the house are poor relative to similar houses.

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If the derived transient thermal model is periodically updated, then the reference transient thermal model may be a derived transient thermal model for the same house from an earlier period, whereby the warning means can warn the user that the thermal properties of the house are deteriorating.

The modelling means may also be responsive to the operation of heating or cooling appliances in the house, whereby the warning means can warn the user of poor or deteriorating performance of the appliances and may automatically summon an engineer to repair the appliances. For example, the system can identify the optimum time for boiler maintenance by comparing the boiler's heating ability with its specification or with its past performance.

A further use of the transient thermal model is to provide a basis for a control means to control the operation of heating or cooling appliances in order to achieve a desired temperature in the house at a given time, using the minimum amount of energy or, if the cost of energy varies during the day, the cheapest amount of energy. Thus the system can determine when the house heating or cooling needs to come on to meet the desired temperature at the given time, rather than always turning on the heating at a fixed, programmed time.

The control means can also be used to switch the heating or cooling appliances periodically on and off at intervals determined in accordance with the transient thermal model to maintain the temperature in the house within a desired range, without the use of a thermostat.

In a third aspect, the invention provides a household energy management system, comprising at least one sensor on the household electricity supply for measuring the instantaneous total power delivered by the electricity supply; means for identifying electrical appliances connected to the supply on the basis of their respective start-up characteristics when the appliances are switched on; means for comparing the sensed start-up characteristics with reference characteristics; and means for warning a user of the

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system when the sensed characteristics differ from the reference characteristics by more than a predetermined limit.

The comparison means may further compare operating characteristics and/or shut down characteristics of the appliances with corresponding reference characteristics.

The system may further comprise means for recording the total time of operation and/or the number of cycles of operation of each appliance, which can be compared against a database of lifetime expectancy and reliability for different appliances. The database may be a local database, internal to the system, or a shared database, accessed via an external network. In the case of a shared database, means are preferably provided for updating the shared database with measured lifetime and reliability data for appliances connected to the system.

The system may further comprise modelling means receiving signals from the comparison means and from the database in order to recommend to the user of the system a program of maintenance or replacement of the appliance.

A household energy management system in accordance with the invention, which monitors the energy consumption of household appliances, can also act as an electricity meter and may indicate the electricity consumption reading to the householder or transmit the reading directly to the electricity provider. If the system is networked to the electricity provider, then the provider can inform the system of changing electricity prices. The system may simply inform the user of these prices or it may be programmed to control household appliances so as to minimize the energy costs to the householder. For example, it may be more cost-effective to increase the background temperature of the house by operating electrical heating appliances at a time of day when electricity is relatively cheap in order to reduce the amount of heating required when demand is at its peak. Alternatively, the electricity provider may be given direct control of the electrical heating appliances.

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Similarly, if the system is networked to a gas supplier, then the supplier can inform the system of changing gas prices. The system may simply inform the user of these prices or it may be programmed to control household gas appliances, such as a gas-fired central heating boiler, so as to minimize the energy costs to the householder. Alternatively, the energy management system or the gas supplier itself may be given direct control of the gas supply via an electrically-operated gas valve.

Methods of operating a household energy management system in accordance with the first, second and third aspects of the invention are also provided.

The modelling functions associated with any of the aspects of the invention may be carried out locally, by computing means provided as part of the system within the house; or remotely, by external computing means accessed via a telecommunications network.

The system allows for standard appliances to be used. Intelligent appliances containing communications and minicomputers can be included but are not essential for this invention. The invention concentrates on using electrical sensors external to existing appliances and linking this to powerful analytical mathematical modelling.

The overall system benefits include:

- Reduced energy consumption.
- Improved householder comfort.
- Improved maintenance and utilisation of expensive capital appliances in the house.
- Reduced cost to the householder through improved energy tariffs.
- Recommending energy saving measures to the householder based on actual measurements of the householder's behaviour, the thermal efficiency of the house and the operational efficiency of household appliances.

The drawings

Figure 1 shows a first way of installing a single central sensor in accordance with the invention into a household electricity supply.

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Figure 2 shows a second way of installing a single central sensor in accordance with the invention into a household electricity supply.

Figure 3 shows the communication links between the single central sensor and the other parts of the system according to the invention.

Figure 4 shows various Internet services to which the system according to the invention may link.

Figure 5 illustrates how the current in a household electricity supply may vary with time.

Figure 6 illustrates the current start-up characteristics of two household appliances

Figure 7 illustrates how the start-up characteristic of an appliance may change over time

Figure 8 shows how a transient thermal model in accordance with the invention may be revised.

Figure 9 shows how a transient thermal model in accordance with the invention may be used to control temperature with no feedback.

Description of preferred embodiments

A typical system

Consider a system, which uses a single central sensor to monitor the flow of electricity into the house. It records/analyses the data in great detail – not only on a minute by minute basis but also the instant an appliance is turned on it analyses the starting current in detail over milliseconds. In this way it determines which appliance has been turned on and how long it has been on for and at what time of day it has been used. It builds mathematical models of:

- All appliances used in the house and their pattern of use
- The house's transient thermal behaviour under heating and cooling conditions

The system is intended not just to monitor the electrical system or the gas heating system but to link the monitoring of gas and electricity together to allow a whole system understanding to be achieved and provide better optimisation of the total energy use within the house. For example, sudden changes in electrical activity can indicate that the

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householder has returned home early from work and elicit a heating response within the controller to increase the house temperature.

These sensors include not only a single central sensor at the point of entry of electricity to the house but also adaptors, which plug into standard wall sockets. The adaptors allow the collection of detailed information and control the appliances they are connected to.

The analysis is performed on computers either local to the house or on the Internet. Communications between the various system items use standard known communication systems i.e. phone, radio, Internet or communication by power cable.

The single central sensor (Figures 1 and 2)

The single central sensor 2 shown in Figure 1 is connected between the electric power cable to the house 4 and the house circuit breakers/distribution board 6, or in other words at the electrical point of entry to the house. The sensor 8 is used to monitor multiple devices. In more advanced versions, greater resolution may be possible by locating a sensor on each ring main out of the electricity meter, as shown in Figure 2.

The single central sensor 2 monitors the electrical power feeding into the house (e.g. current, voltage and power factor), stores appropriate data and analyses the data to determine what is happening with the house's appliances and with the occupants. The single central sensor 2 contains electronic computing capability including storage (long and short term), processing power, battery back up (not shown) and communications capability with the wider network and local devices.

Communications (Figures 3 and 4)

Existing communication methods will be used with the system to allow communication between all parts of the system including Internet servers, databases of information, the single central sensor 2, the moveable adaptors 10, the householder's personal computer and the householder's mobile phone etc, as shown in Figure 3. These existing communication methods include the well-known methods of linking by telephone, radio,

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cable and communications by power cable. The system designer will simply use the most appropriate available technology to achieve the communication required. Figure 4 illustrates in more detail the type of information that may be sent to and from the system over the Internet, as well as the sources and recipients of that information.

Stored data

The data acquired will be stored on a database. This will include data of appliance characteristics, times appliances are on and off and derived data. It can be stored either within the house in some form of small computer, perhaps as part of the single central sensor 2, or on a more powerful server on the Internet-based network of computers.

Monitoring appliance use (Figures 5 and 6)

The system can determine the starting and stopping of appliances used in the house by monitoring the magnitude of current step changes. Consider the example shown in Figure 5. At time 10 minutes an electric light of current 1 Amp is turned on. Ten minutes later a heater of 3 Amp rating is turned on and at time 60 minutes the electric light is turned off. At this point in time the system knows that the light has been on for 50 minutes and knows its power and can therefore calculate the energy consumed by the light (kW.h). At the end of the day the system is able to summarise how much energy each of the house's appliances has used during the day. This can be provided as a summary to the householder such as on a web page or email.

The actual type of appliance started can be determined by analysing the start-up characteristics. As shown in Figure 6, some appliances have quicker response characteristics than others. Type A and Type B have similar final operating currents but they differ in start-up characteristic. Type A has a quick peak in current, suggesting that it is a resistive load like a light bulb, which has a low resistance when cold but this resistance increases once it is hot and consequently the current falls. Type B takes longer to reach its peak current, perhaps indicating that it is a motor with a magnetic reluctance rather than a resistance and a starting inertia quite different to the type A appliance. The system can recognise the appliances by comparing them to a pre-programmed store of

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characteristics, which are loaded on the single central sensor 2. These signature characteristics will be pre-programmed into the single central sensor 2 before installation in the house, so it can recognise what is being turned on and off. Alternatively the system can learn the signatures during use.

It will be possible to teach the system to recognise a new appliance if it is not immediately recognised from the data bank of known appliances. For example, if the householder starts using an old valve-driven radio which is not previously known, the single central sensor system may identify that an 'unknown appliance' has been used and email the householder asking what the appliance is. By replying, the householder will teach the system to recognise the valve radio for next time. This new characteristic can be used by the householder's system and also sent electronically to the other single central sensors on the Internet network for use in other houses.

Clearly a householder will use some appliances of identical power rating and very similar start up characteristic such as similar light bulbs. The single central sensor has two ways to address this issue. It can determine the difference by noticing small differences in start-up characteristic which arise from small changes in reluctance and resistance due to cable length differences or it can make a best approximation to what is happening in the house. Any approximation will lead to some uncertainty and error, however few appliances are exactly identical and so the error will be small. Alternatively moveable adaptors 10 can be used between the appliance and the fixed wall outlet. These are explained in more detail below.

New versions of control software can be sent to the single central sensor 2 through the network communications.

Initiating the system

On first installing the system it may be best if the householder runs through an initiation sequence whereby each appliance is turned on and off in a predefined sequence. For example, the householder might be asked to follow the following initiation sequence:

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- Turn all household appliances off
- Turn all appliances in Bedroom 1 on
- Turn all appliances off
- Bedroom 2 all on
- Turn all appliances off
- Bedroom 3 all on
- Turn all appliances off
- Kitchen all on
- Turn all appliances off
- Living room all on
- Etc

This method allows the system to learn in which room each appliance is kept. For example the 30W radio might be in Bedroom 1. This helps communications between householder and computer if the location of appliances is known. An initiation sequence like this is already described in US Patent application 2003/0050737.

The householder will be able to access data records of appliance use and so will be able to inform the system of the whereabouts of any appliances that the system cannot directly deduce. So for example if the householder can see that the system did not correctly identify that a TV had been moved from the lounge to bedroom 1 the householder will be able to update this over the Internet interface (standard HTML web pages with radio buttons etc).

Alternative way to teach the system to recognise appliances

An alternative way to teach the system to recognise appliances is to include at least one moveable adaptor 10 as part of the system. This is an adaptor which fits between the appliance power plug and the fixed wall outlet.

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It may contains electronics that allow it to measure the current flowing into the appliance, in much the same way as the single central sensor 2 and communicate this to the single central sensor.

Alternatively, the moveable adaptor 10 may just include a transponder, which sends a simple signal to the single central sensor 2 informing it that current is flowing. In this way the single central sensor 2 can associate any transponder signals from the adaptor 10 with the instantaneous changes in household current already detected by the single central sensor 2.

The moveable plug adaptor 10 will help with identification of identical appliances. For example, if two appliances are turned on at the same instant in time it may become difficult to determine what has happened. In general this can probably be ignored, as it is unlikely that appliances will turn on over the same millisecond and any errors introduced in this way will be a small part of the total electrical consumption.

However it may be prudent to use an adaptor 10 with high consumption appliances so that more detailed data can be provided to the system. If, for example, a washing machine were fitted with one of these then the adaptor 10 would signal when current flows through it and the single central sensor 2 would know the difference between this appliance and other general appliances being turned on in the house.

The adaptor 10 could also be used to turn on and off the appliance, whereby the system could manage the appliance to run at night when electricity is cheaper.

A further advantage of the moveable adaptor 10 is that it can be moved to a different wall outlet. For example, if the system recognised and learned the behaviour of a refrigerator at the first outlet it could email the householder and request the householder to move the adaptor to a new outlet. The message might read: *'At 18:06 this evening an appliance was turned on of 60 watts and the system can not determine what it is. Please move Mobile Adaptor 3 from current location on refrigerator to the outlet socket using this*

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*appliance and allow the system to learn the characteristics of this appliance. Thank you—
Click here if you do not want another email reminder of this event. '*

Eventually the householder may settle on having a few of these mobile adaptors 10 in the house, some of which are permanently connected to important appliances and are used to monitor and control these appliances directly. The remainder of these moveable units 10 may be moved around the house at the discretion of the householder and in sympathy with requests from the networked control system.

Another advantage of using a moveable adaptor 10 is that it could recognise which appliances use significant electricity even when turned off or in standby mode. It is common for household appliances to use built in transformers, which use considerable energy heating the transformer even when the appliance is effectively turned off. The adaptor will inform the central monitor of power at all times and the system can then recognise that the appliance is consuming whilst in standby mode and send an email to the householder recommending that the appliance be disconnected from the mains when not in use.

Whenever the householder buys a new appliance he would be best advised to connect it with an adaptor 10 for the first few days of operation so that the system can learn the start and stop characteristics of the appliance. This allows the system to evaluate the consumption rate of the appliance and email recommendations to the householder such as above.

The adaptor 10 could be fitted with additional devices to provide location information to the system. For example it could emit a radio signal which is used to triangulate its physical position in space. In this way the central detector could determine the physical location of appliances such as upstairs, 3 metres north, 1 metre east. In this way a detailed map of both the appliances and the location of a householder using an appliance can be pinpointed. This all helps to populate a detailed appliance database and improve communication between the system and householder.

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By having a mobile adaptor 10 and rotating it between electrical sockets, the system can use fewer special adaptors than the prior art systems which have permanently fixed adaptors.

Behaviour pattern analysis

Analysing the stored data can provide information on the householder's patterns of behaviour. It will be possible to observe patterns of behaviour over a weekly basis. For example, the system can notice that every Tuesday the television is switched on at the same time of day and notice on Fridays that the householder gets home 2 hours later than on other workdays. Having detected these patterns of behaviour, the system can alter the control of appliances to provide improved comfort and cost to the householder. This is particularly useful in optimising high energy-consuming appliances such as heating and air conditioning. So on the days that the householder is expected home late the system can defer heating the house to its full temperature until just before the householder is expected. Other applications would be to cook or defrost food in anticipation of the householder's arrival, to complete a washing machine cycle at a time when the householder is likely to be available to remove the washing or to record automatically a television programme that the householder regularly watches. The householder would have to agree to this level of autonomous control and would interface with the computer via the communications network either through a web page or through an interface panel within the house.

Instantaneous behaviour analysis

In addition to building a model of the historical behaviour of the occupants of the house, the system can detect the instantaneous behaviour at any one instant and this can be used to modify the energy control parameters.

Appliances are generally turned on when an occupant of the house presses a switch. The system can use this to determine what activity is taking place within the house. At any

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one instant in time the behaviour model can probably deduce how many occupants are in the house, where they are and a rough idea of what they are doing. This could be used to

- control the temperature of the room the occupants are in. Other rooms could be heated to a lower temperature (if individual room temperature control is available).
- recognize a sudden change of behaviour such as an unexpected reduction in activity of an elderly or infirm person. The change in behaviour pattern can be used to email a warning to a nearby relative.

The single central sensor system can alter the control temperature of the house if the householder is obviously active or has gone out. The activity level of the householder can be inferred from the appliances detected within the house. For example, if the householder is using the vacuum cleaner the system might decide to reduce the control temperature within the house until the cleaning has stopped. A reduction in temperature can both reduce the energy consumed by the house and also make the environment more comfortable for the householder whilst they are exercising with the vacuum cleaner. On the other hand, if the system knows that only one person lives in the house and has noticed that the TV is switched on, it may be reasonable to deduce that the householder is static and a slight increase in house temperature would be more comfortable. If two people are in the house then a gated logic decision is required in the control functions to ensure the warmest state is chosen (e.g. the temperature is warmed for a static person even if other one is using the vacuum cleaner)

Alternatively, if the burglar alarm is set, then the system can deduce that all occupants of the house are out and lower the house temperature. A special transponder could be included in the burglar alarm to communicate directly with the single central sensor to inform it that the alarm is set and all occupants are out of the house.

The position and movement of the householder can be noted from the householder's mobile phone and the location detected by the phone network. If the wider system includes access to the mobile phone network then the distance of the householder from their home can be determined and if the householder is far away then the house

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temperature can be lowered. For example if the transient model says the house can be heated up to full temperature within 30 minutes and the householder is known to be more than 30 minutes away then the heating system can be turned off completely.

Location information could also be provided based on other monitored activities of the householder. For example, if the householder is using a computer at his/her workplace, then that computer or an Internet service provider could relay the householder's location to the household energy management system. The system could also be networked with other locating systems, such as a congestion charging system that would monitor the location of the householder's car.

In summary, the household temperature can be linked to the activity of the householder and his actual location rather than being linked to a time clock as with current house heating systems.

Meter reading

The system builds up and records detailed energy consumption data and by integrating this over time it can record the total energy (kW.h) used and so become an energy meter. This allows billing information to be sent to the customer and the utility directly over the communications network, as shown in Figure 4.

Not only can the system determine the total energy consumption over the day or week, but it also knows what time of day these units of electricity are used. This enables it to be used by a utility selling electricity to offer the customer variable tariffs during the day or during the week or month. So a customer could chose a tariff arrangement, which gives low price electricity most of the time but very expensive electricity at peak times of demand. This option is already available industrially but is too expensive to meter for small scale domestic users. A customer choosing such a tariff arrangement would save money by getting a better rate for general consumption and as long as consumption is minimised during peak hours would save overall. (It should be noted that in the U.K.'s electricity market, peak hourly electricity prices during the year can reach 100 times

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average electricity price and so it would be important for the householder to know when to cut back.)

This variable tariff system could become quite sophisticated offering different rates over the course of one day and different rates from day to day. The customer could be kept informed of these tariffs over the Internet interface available through the total networked system or through daily emailed updates of any rate changes.

The system can identify when the householder operates high consumption appliances and may benefit by altering the time of operating these appliances – e.g. turning the washing machine on at a night when electricity is cheaper.

Interaction with energy utility

The system described can be integrated to communicate directly with the supplier of energy. For example a feature can be included, which allows the electricity supplier to turn appliances on and off to smooth the peak demand which occurs on the grid network. The householder would benefit through a price reduction under such an arrangement.

It is also possible to allow the gas supplier to control the gas heating of a house. For example, on the coldest winter days the gas supplier knows that demand is going to peak at its highest level of the year and may not have the capacity to pass enough gas down the pipelines to meet demand. With the proposed system it is possible for the networked houses to have heating turned on a few hours early such that the house is pre-warmed before peak demand time. Although this is likely to increase the total gas consumption it will reduce the peak demand later in the day and has this operational benefit to the gas supplier who can avoid building additional gas transmission pipelines and pumping equipment. The customer can be encouraged to buy into this scheme through improved annual prices.

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Monitoring electrical quality

The single central sensor 2 located at the point of electrical entry to the house can be used to monitor the quality of electricity supplied to the building. In this way it can monitor not only total loss of power during power cuts and its duration but also alterations in frequency, brief spikes of power, dips in voltage. This information can be useful to the householder in monitoring the quality of electricity supplied. If the electricity does not meet requirements, the householder has the opportunity of demanding compensation or improvements from the supplier with the evidence provided by the single central sensor 2. Communication could again be achieved through the Internet, such as web page access or email.

Appliance health monitoring (Figure 7)

The system can be used to compare the start-up characteristics of each appliance on a day-by-day basis. In this way the system can monitor the health of the householder's appliances and warn of problems. For example, an electric motor in a washing machine may have a start-up characteristic when new of Type B, as shown in Figure 7. However, the characteristic of the motor will change as the motor ages and the bearings stiffen and the brushes wear. Towards the end of normal life, the brushes may arc and the motor will take longer and/or require more current to reach speed. This can be monitored by the single central sensor 2. The analysis software can detect these changed characteristics (such as a move to characteristic Type B_x) and compare them to known acceptable behaviour. If the appliance falls outside predetermined limits then an alarm (e.g. an email/text message) can be sent to either the householder or a maintenance technician who can arrive and fix the motor before it fails. Early warning like this provides the householder with preventative maintenance, which reduces the inconvenience and cost of unexpected failures.

The single central sensor could monitor for arcing across the brushes of a motor and to include this function it would monitor for electrical noise during continuous operation, and not just the motor start-up characteristics.

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The system will be able to carry out optimisation calculations and recommend to the householder whether an appliance is worth repairing or is best replaced. For example, it may calculate that the washing machine, which is about to fail, has a high probability of further failures (based on a database of typical failure rates). It may find that the cost of two repairs in succession combined with say improved energy consumption of the latest appliance would mean that the householder would be best to replace the appliance rather than repair it. An appropriate message can be sent to the customer with or without an option to buy a replacement appliance through the system. This sort of calculation could be quite detailed including interest rates, probability of failure rates and details on spare parts costs, a database of known appliances and their life expectancies. It offers an online optimisation cost calculation, which is not currently feasible to a householder.

A further appliance health monitoring method is available through counting the number of cycles and hours of operation an appliance has completed. In this way any appliance can be monitored for life consumed and an estimate made of remaining life based on a database of typical expected lifetimes for appliances such as fridges, freezers, cookers or heating boilers. This database could even include model specific data for improved accuracy.

Over time the networked system would learn by itself and build its own life expectancy databases from its own data. This database would be useful as a way of evaluating the value of different appliances and recommending longer-lived appliances for householders to buy.

Transient thermal model

A transient thermal model of the house can be generated and validated by the system. It can be used to:

- Determine when the heating should be turned on and off and so optimise the use of the heat consumed.
- Carry out health monitoring of the heating/insulation systems and recommend maintenance actions.

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- Compare the house to other houses or standard models of average houses

A transient thermal model of the house heating is a mathematical model of the house heating characteristics including terms for the steady state heat loss and also terms for its transient thermal performance. For example, a heavy, brick built house will take longer to heat up and cool down than a lightweight, wooden/fibreboard construction and terms in the mathematical model are included for mass, thickness and specific heat of materials etc.

Terms in the thermal model would include:

- Heat transfer coefficient inside house.
- Heat transfer coefficient outside house – terms including effect of wind, rain, humidity etc.
- Temperature inside.
- Temperature outside.
- Materials of construction including thickness, thermal insulation qualities, mass, specific heat.
- Wind resistance of apertures such as doors and windows.

These parameters can be estimated at first from the householder informing the system of the age of house and its type of construction. From then on the model will measure the actual response of the house to varying thermal conditions and adapt the mathematical model until a good fit is obtained between actual response and mathematically modelled response. This is illustrated in Figure 8.

At time 0 the heating is turned on and the actual temperature rises (as shown by Line 1) until it reaches the control temperature at its peak and the heating is turned off. From here the temperature falls according to Line 2 until the minimum temperature is recorded and the heating is started up again. By sensing the electrical operation of heating controls such as a thermostat or gas valve, the single central sensor 2 will detect the time points when the maximum and minimum temperatures are reached and it can compare the actual

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times to the mathematically predicted response. Differences in these two will demand the software changes the coefficient terms in the model until the best fit with all known data is achieved. For the first few days the system may be inaccurate, but later once a larger database of known heating and cooling times is known the mathematical model will become increasingly accurate.

The system can use network data to improve validity. For example it can be informed of local weather from existing Internet weather databases which have weather information from nearby weather stations.

Improved heating control

In traditional systems the householder uses a time controller to define when the heating (or air conditioning) should turn on and off. With the use of the transient thermal model, the householder can now define when the house is to reach the controlled temperature schedule rather than when to start heating. This allows the single central sensor system to calculate the optimum time to turn on. For example, say the householder returns home at 17:30 in the evening and wants the house at the desired temperature at 17:30. The system can use the transient model to calculate the time it will take to reach the desired temperature: on a cold windy day this might be 1 hour and on a mild day it might be 30 minutes. In this way the heating system is turned on for the minimum time and the house consumes the minimum heat energy.

Control to a lower temperature than the thermostat set temperature (Figure 9)

The transient thermal model can be used to provide a crude control system without referring to the house thermocouple temperature sensor. This would allow the system to control to a reduced temperature (Line 2) without alteration to the existing thermostat fitted to an existing house heating system, which is set at a higher temperature (Line 1). Figure 9 shows how this would happen. The transient model would be used to determine how fast the house heats up and cools down and the heating appliance (such as a gas boiler) would be turned on and off in response to the mathematical prediction of internal temperature in order to maintain the temperature close to a desired average. This does not

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require a house thermocouple for feedback, which means it would have a tendency to drift in temperature, as seen in the slope of Line 2 in Figure 9. This is unacceptable in the long term but may serve for short periods when temperatures below the house thermostat set point are required.

Thermal efficiency monitoring

The validated thermal transient model can be used to compare the house to national house norms. In this way the thermal characteristics of the house can be compared to acceptance limits and weaknesses in the house thermal characteristics can be identified and remedied. For example the system may notice that the house cools down unusually quickly on windy days and yet has a normal cooling characteristic under still air conditions. This will indicate that the house is susceptible to wind and is therefore draughty. An email could be sent to the householder or maintenance contractor to investigate and remedy the situation.

Each of the terms in the thermal transient model can be compared in this manner and the house can be evaluated including the specific heat properties of building materials. Energy saving measures that are recommended in this way are thus based on actual measurements of the house characteristics, rather than generic recommendations which are given to all householders.

Heating health monitoring

The transient thermal model can be used to determine the operational health of the heating system within the house. As explained previously, the system will continuously adjust coefficients within the transient thermal model to ensure it aligns with the true house thermal response. Over months of operation, these coefficients will drift as the thermal characteristics of the house worsen with age. This will be most noticeable with a heating boiler as it becomes fouled through use – the house will begin to take longer to heat up. This gradual drift in characteristics can be used to monitor the degradation of the heating boiler and when a predetermined limit is met then maintenance action can be recommended to the householder or service provider. This active monitoring of boiler

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health will provide the householder with more optimal expenditure on maintenance, rather than just maintaining the boiler annually when it may still be in good condition.

It may be thought that a simpler health monitoring system would be to just monitor the time it takes for the house heating to reach temperature, without the use of the transient thermal model. However such a simple system makes no allowance for the changes in weather conditions that occur. By using the transient thermal model as the basis, changes in weather are automatically accounted for within the model leaving just deterioration in boiler efficiency as the remaining explanation for deteriorating performance.

On a system where the single central sensor 2 has difficulty detecting changes such as the electrically powered gas valve opening on the gas boiler, a special house thermostat that communicates with the single central sensor 2 can be used. This thermostat acts as a normal house thermostat – switching open and closed as the temperature rises and falls through set limits. However, it communicates this to the single central sensor 2 so that the system can still determine when temperature limits are reached and the transient thermal model can still be aligned with the real thermal response.

Managing the system

The system described is capable of making decisions for the householder on a minute by minute basis. Initially it will do this in a pre-programmed way – making assumptions about house temperature and timings that are best estimates. However, the system needs a method of improving, learning and adapting to the particular householder's preferences. The householder can do this by informing the system as to whether the result is acceptable. For example, if the householder finds the temperature one day to be too cool in the morning, the householder could open a web page interface window on the system's Internet interface and click appropriate pages to instruct the system that the wrong response was achieved. The more this is done the more the system will adapt to the actual preferences of the user.

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CLAIMS

1. A household energy management system, comprising:
 - at least one sensing means, which measures energy use by occupants of the house;
 - a modelling means, which uses the energy measurements from the sensing means to build a model of the behaviour of the occupants; and
 - a control means, which controls the operation of one or more household appliances in the house on the basis of the model.
2. A household energy management system according to claim 1, wherein the modelling means builds a predictive model of the pattern of behaviour of the occupants over time.
3. A household energy management system according to claim 2, wherein the modelling means continually refines the model in response to new measurements by the sensing means.
4. A household energy management system according to claim 2 or claim 3, wherein the predictive model predicts the times when the house will be occupied and the control means controls the operation of one or more household appliances on the basis of the predicted times when the house will be occupied.
5. A household energy management system according to claim 4, wherein the control means controls the operation of heating or cooling appliances to achieve a desired temperature when the model predicts that the house will be occupied.
6. A household energy management system according to claim 5, wherein the control means controls the operation of the heating or cooling appliances in such a way as to minimize the amount of energy used to achieve the desired temperature.

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7. A household energy management system according to any preceding claim, wherein the modelling means builds a temporary model of the current behaviour of the occupants.
8. A household energy management system according to claim 7, wherein the control means controls the operation of heating or cooling appliances to achieve a desired temperature according to the current level of activity of the occupants.
9. A household energy management system according to any preceding claim, wherein the model of the behaviour of the occupants includes a determination of whether the house is occupied.
10. A household energy management system according to claim 9, wherein the modelling means has an interface with an intruder alarm system in the house and uses signals received from the intruder alarm in its determination of whether the house is occupied.
11. A household energy management system according to claim 9 or claim 10, wherein the system receives signals indicating the location of the occupants when they are not in the house and wherein the modelling means uses the location signals in its determination of whether the house is occupied.
12. A household energy management system according to claim 11, wherein the modelling means further uses the location signals to predict when the occupants might return to the house.
13. A household energy management system according to claim 11 or claim 12, wherein the locations of the occupants are determined by a mobile telephone network or by a global positioning system.

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14. A household energy management system according to any preceding claim, further comprising alerting means, which trigger an alert when an unexpected pattern of behaviour by the occupants of the house is detected.
15. A household energy management system according to any preceding claim, wherein the sensing means measures electrical activity within the house.
16. A household energy management system according to claim 15, wherein at least one sensing means comprises a moveable sensor for location between an electricity supply outlet and an individual electrical appliance to measure the energy use by that appliance.
17. A household energy management system according to claim 15 or claim 16, wherein at least one sensing means comprises a fixed sensor on the household electricity supply to measure the respective energy uses of a plurality of electrical appliances connected to the supply, the sensor comprising means for measuring the instantaneous total power delivered by the electricity supply and means for identifying the appliances on the basis of their respective start-up characteristics when the appliances are switched on.
18. A household energy management system, comprising:
 - one or more temperature sensors for measuring the temperature inside the house;
 - a source of information about the temperature outside the house;
 - a modelling means, which uses the inside and outside temperature measurements to derive a transient thermal model of the house, which can predict changes in the inside temperature on the basis of the information about the outside temperature;
 - means for comparing the derived transient thermal model with a reference transient thermal model; and
 - means for warning a user of the system when the derived model differs from the reference model by more than a predetermined limit.

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19. A household energy management system according to claim 18, further comprising a source of information about the wind speed and/or humidity outside the house, which is used by the modelling means to derive the transient thermal model of the house.
20. A household energy management system according to claim 18 or claim 19, further comprising one or more sensors outside the house, which are the source of the information about the outside temperature and/or wind speed and/or humidity.
21. A household energy management system according to any of claims 18 to 20, further comprising means for receiving broadcast weather information, which is the source of the information about the outside temperature and/or wind speed and/or humidity.
22. A household energy management system according to any of claims 18 to 21, wherein the reference transient thermal model is a standard model for the type of house in which the system is installed.
23. A household energy management system according to claim 22, wherein the warning means warns the user that the thermal properties of the house are poor.
24. A household energy management system according to any of claims 18 to 21, wherein the derived transient thermal model is periodically updated; and wherein the reference transient thermal model is a derived transient thermal model from an earlier period.
25. A household energy management system according to claim 24, wherein the warning means warns the user that the thermal properties of the house have deteriorated.
26. A household energy management system according to claim 24 or claim 25, further comprising means for informing the modelling means when heating or cooling appliances in the house are operated, whereby the modelling means models the thermal

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response of the house to operation of the appliances and whereby the warning means warns the user of poor efficiency or deteriorating efficiency of the appliances.

27. A household energy management system according to claim 26, wherein the warning means further comprises signalling means for summoning an engineer to repair the inefficient appliances.

28. A household energy management system according to claim 26 or claim 27, wherein the means for informing the modelling means when heating or cooling appliances in the house are operated includes sensing means for measuring electrical activity within the house.

29. A household energy management system according to claim 28, wherein at least one sensing means comprises a fixed sensor on the household electricity supply to measure the respective energy uses of electrical appliances connected to the supply, the sensor comprising means for measuring the instantaneous total power delivered by the electricity supply and means for identifying the appliances on the basis of their respective start-up characteristics when the appliances are switched on.

30. A household energy management system according to any of claims 18 to 29, further comprising a control means, which controls the operation of heating or cooling appliances based on the predictions of the transient thermal model, in order to achieve a desired temperature in the house at a given time using the minimum amount of energy.

31. A household energy management system according to claim 30, wherein the control means switches the heating or cooling appliances periodically on and off at intervals determined in accordance with the transient thermal model to maintain the temperature in the house within a desired range, without the use of a thermostat.

32. A household energy management system, comprising:
at least one sensor on the household electricity supply for measuring the instantaneous total power delivered by the electricity supply;

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means for identifying electrical appliances connected to the supply on the basis of their respective start-up characteristics when the appliances are switched on;

means for comparing the sensed start-up characteristics with reference characteristics; and

means for warning a user of the system when the sensed characteristics differ from the reference characteristics by more than a predetermined limit.

33. A household energy management system according to claim 32, wherein the comparison means further compares operating characteristics and/or shut down characteristics of the appliances with corresponding reference characteristics.

34. A household energy management system according to claim 32 or claim 33, further comprising means for recording the total time of operation and/or the number of cycles of operation of each appliance.

35. A household energy management system according to claim 34, including means for accessing a database of lifetime expectancy and reliability for different appliances, against which the logged data can be compared.

36. A household energy management system according to claim 35, wherein the means for accessing the database provide access to a database on an external network; and wherein the means for accessing the database also allow the database to be updated with measured lifetime and reliability data for appliances connected to the system.

37. A household energy management system according to claim 35 or claim 36, further comprising modelling means receiving signals from the comparison means and from the database in order to recommend to the user of the system a program of maintenance or replacement of the appliance.

38. A household energy management system according to any of claims 32 to 37, further comprising means for recording the quality of the electricity supply.

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39. An energy management network, comprising:
- storage means for storing a database of lifetime expectancy and reliability for different household appliances;
 - a plurality of household energy management systems in accordance with any of claim 35 to 38; and
 - a network to which the storage means and the energy management systems are connected to enable communication of data between the database and the energy management systems.
40. A method of operating a household energy management system, comprising the steps of:
- measuring energy use by occupants of the house;
 - using the energy measurements to build a model of the behaviour of the occupants; and
 - controlling the operation of one or more household appliances on the basis of the model.
41. A method of operating a household energy management system, comprising the steps of:
- measuring the temperature inside the house;
 - receiving information about the temperature outside the house; and
 - using the inside and outside temperature measurements to derive a transient thermal model of the house, which can predict changes in the inside temperature on the basis of the information about the outside temperature;
 - comparing the derived transient thermal model with a reference transient thermal model; and
 - warning a user of the system when the derived model differs from the reference model by more than a predetermined limit.
42. A method of operating a household energy management system, comprising the steps of:

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measuring the instantaneous total power delivered by the household electricity supply;

identifying electrical appliances connected to the supply on the basis of their respective start-up characteristics when the appliances are switched on;

comparing the sensed start-up characteristics with reference characteristics; and

warning a user of the system when the sensed characteristics differ from the reference characteristics by more than a predetermined limit.

Amendments to the claims have been filed as follows

CLAIMS

1. A household energy management system, comprising:
 - at least one sensing means, which measures energy use by occupants of the house;
 - a modelling means, which uses the energy measurements from the sensing means to build a model of the behaviour of the occupants; and
 - a control means, which controls the operation of one or more household appliances in the house on the basis of the model.
2. A household energy management system according to claim 1, wherein the modelling means builds a predictive model of the pattern of behaviour of the occupants over time.
3. A household energy management system according to claim 2, wherein the modelling means continually refines the model in response to new measurements by the sensing means.
4. A household energy management system according to claim 2 or claim 3, wherein the predictive model predicts the times when the house will be occupied and the control means controls the operation of one or more household appliances on the basis of the predicted times when the house will be occupied.
5. A household energy management system according to claim 4, wherein the control means controls the operation of heating or cooling appliances to achieve a desired temperature when the model predicts that the house will be occupied.
6. A household energy management system according to claim 5, wherein the control means controls the operation of the heating or cooling appliances in such a way as to minimize the amount of energy used to achieve the desired temperature.

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7. A household energy management system according to any preceding claim, wherein the modelling means builds a temporary model of the current behaviour of the occupants.
8. A household energy management system according to claim 7, wherein the control means controls the operation of heating or cooling appliances to achieve a desired temperature according to a current level of activity of the occupants as modelled in the temporary model of the current behaviour of the occupants.
9. A household energy management system according to any preceding claim, wherein the model of the behaviour of the occupants includes a determination of whether the house is occupied.
10. A household energy management system according to claim 9, wherein the modelling means has an interface with an intruder alarm system in the house and uses signals received from the intruder alarm in its determination of whether the house is occupied.
11. A household energy management system according to claim 9 or claim 10, wherein the system receives signals indicating the location of the occupants when they are not in the house and wherein the modelling means uses the location signals in its determination of whether the house is occupied.
12. A household energy management system according to claim 11, wherein the modelling means further uses the location signals to predict when the occupants might return to the house.
13. A household energy management system according to claim 11 or claim 12, wherein the locations of the occupants are determined by a mobile telephone network or by a global positioning system.

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14. A household energy management system according to any preceding claim, wherein the sensing means measures electrical activity within the house.
15. A household energy management system according to claim 14, wherein at least one sensing means comprises a moveable sensor for location between an electricity supply outlet and an individual electrical appliance to measure the energy use by that appliance.
16. A household energy management system according to claim 14 or claim 15, wherein at least one sensing means comprises a fixed sensor on the household electricity supply to measure the respective energy uses of a plurality of electrical appliances connected to the supply, the sensor comprising means for measuring the instantaneous total power delivered by the electricity supply and means for identifying the appliances on the basis of their respective start-up characteristics when the appliances are switched on.
17. A method of operating a household energy management system, comprising the steps of:
 - measuring energy use by occupants of the house;
 - using the energy measurements to build a model of the behaviour of the occupants; and
 - controlling the operation of one or more household appliances on the basis of the model.



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Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 14, 18	GB 2212949 A (STONECREST LIMITED) Whole Document.
X	1, 14, 18	WO 2002/090914 A1 (EMERSON RETAIL SERVICES INC) Whole Document.
A		EP 0883050 A1 (ELECTRICITE DE FRANCE) See WPI abstract. AN - 1999 - 011837 [02]
A		US 5197666 (WEDEKIND) Whole Document.

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FOSS A/S [DK/DK]; DK-6430 Nordborg (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): IVANG, Lone
[DK/DK]; Sundmarksvej 22, DK-6400 Sønderborg
(DK). GARM, Fester [DK/DK]; Funderholmevej 62,
DK-8600 Silkeborg (DK). ANDERSEN, Ejner, Kohberg
[DK/DK]; Flædbækvej 5, Hlsrup, DK-6430 Nordborg
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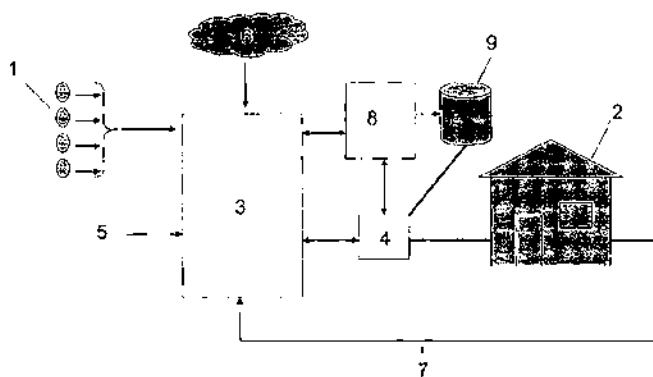


Fig. 1

(57) Abstract: This invention relates to a unique occupancy-based electronic control of energy consuming devices, such as house-
hold devices like, but not limited to, thermostats, HVAC systems, radiators in general, or any device consuming energy even though
no users of the device are present. The control and/or regulation is based on the distance and velocity of the inhabitants relative to
the household. An additional feature is a peak load management system ensuring to store energy in energy reservoirs prior to load
peaks on the electricity distribution network, using this energy during the load peaks.

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DISTANCE REGULATED ENERGY CONSUMING DEVICES

5 Background of the invention

Many residential homes in e.g. the USA only have one thermostat controlling the whole house. The thermostat is often located next to the main entrance, making installations very standardized and easy to handle.

- 10 Furthermore, a large share of these households are only equipped with a simple heating/cooling electro-mechanical thermostat without any possibility of programming. In the few households having a programmable thermostat, this is highly dependant on the owner being able to program it correctly. The world wide waste of such energy resources gives a huge
15 potential for energy savings.

- Further, the consumption of electricity is not evenly distributed over the year, not even over the day. About two to four times a day, normally in the morning and in the evening, the consumption of electricity is very high,
20 causing load peaks on the electricity distribution network. Sometimes the peaks are so big that black-outs occur.

- This invention relates to the reduction of the consumption energy when it is not needed.

25

Summary of the invention

- This invention relates to a unique occupancy-based electronic control of energy consuming devices, such as household devices like HVAC
30 systems, or any other devices consuming energy even when no inhabitants or persons are using or even being close to the devices.

The basic feature of this invention is to adjust the energy consuming devices according to residents/users locations, where the locations are provided by their cell phone/mobile phone or any other portable device being trackable or traceable in geographic location and in time (either via
5 GPS or triangulating), in the following being referred to as their position identification device or devices..

One preferred, but non-limiting, example of the invention relates to the control of a thermostat controlling the cooling and heating of a household
10 by a HVAC system. The idea of the invention, therefore, is to facilitate energy savings by allowing the HVAC systems to drift off when the comfort temperature is not required, as the house is not occupied.

The underlying principle being that the household thermostat will be so
15 intelligent that the energy saving will happen automatically without the household members actually having to do something for it and without compromising on the comfort.

The idea for the occupancy-based electronic thermostat example is that:
20

1. If no persons are at home, the thermostat will automatically alter the set-point away from the specified comfort temperature.
2. The occupancy detection is built-in and will be linked to the
25 household members' position identification device.
3. By linking to the individual position identification device ,it will be possible to off-set the comfort temperature in accordance with the household members' distance to the home (being at work, in
30 school, on holiday etc.); ensuring that the comfort temperature will be re-established before their return by tracking the distance.

3

4. Additionally, the system will also be able to receive information about the current weather, making automatic night set-back etc., possible via the phone system.

- 5 The concept naturally bears the potential to be expanded to include other applications – e.g. terminating stand-by functions while the household is not occupied.

In an optional, and additional, more advanced embodiment of the present
10 invention, the energy control system maps the individual resident's in a given single household based on their patterns of movement, where the maps vary in a number of dimensions or parameters, such as the residents distance from household, travelling speed, the time of day, the week and the month.

15

The energy control system, preferably adaptively, learns the resident's typical behaviours and patterns of movement by their position identification device, and uses these to predict a given behaviour of a resident, what the continuation of this behaviour will be, and when the resident will be
20 expected to arrive at the household.

The energy control system preferably uses a dynamic model with deviation control to form the map of the single resident's patterns of movement, based on data obtained automatically from the individual
25 resident's position identification devices. This method gives the energy control system the possibility to fully automatically optimize the overall efficiency of the energy usage in the household.

The energy control system enables convenient and fully automatic energy
30 saving in any household by allowing the climate comfort zone (temperature, humidity, amount of circulated air, incoming sunlight) drift away from a pre-defined zone of the resident's, when the household is not

occupied. Furthermore, the energy control system will switch off all non-essential energy users e.g. TV, PC, DVD, entertainment centre, electric tooth brush and etc. when no one is around to use them. At the same time, the energy control system pays attention to possible return of any resident to ensure that the climate comfort zone is restored before arrival and ensure that the electric equipment is ready to use again. The essence being that the energy saving is convenient and does not cause any lack of comfort for the residents.

Additional to the resident's location, travelling speed and the time and date, the energy control system may combine the ambient environmental conditions, the resident's location information and the indoor environmental conditions to adjust the indoor temperature and also adjust other environmental parameters, like humidity, amount of circulated and/or re-circulated air to control the indoor air pollution.

The energy control system can be installed in houses, apartments, small offices/commercial buildings, or any other place where an improved energy reduction may be obtained by tracking the users of the place, compared to for example an energy consumption pre-programmed in time.

The energy control system can be split up into independent units or incorporated into one single, combined unit.

In an additional or alternative embodiment of the present invention, the system comprises peak load management.

Since peaks in the local, regional and national energy consumption are predictable through historic data, the energy control system ensures lowering of the temperature of the household before the peaks occur, perhaps by some offset point temperature predetermined or optionally being calculated based on parameters such as the time for raising the

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temperature back to the initial value and the distance and e.g. velocity of the inhabitants relative to the household, and the external conditions such as internal and external humidity, external temperature and weather conditions, cloudiness etc.

5

In this embodiment the system may comprise means for storing energy in any manner as known in the art such as batteries, such means shall in the following in general be referred to as energy reservoirs. The system then comprises a storage management system able to ensure that energy is
10 stored in the energy reservoirs prior to the peak load, and then used during the peak load period, thereby reducing the load on the power grid. This will reduce the load peaks, and give a more evenly spread electricity consumption. Further, it will reduce the amount of standby power plant needed by the energy companies; it will reduce the end user's electricity
15 bill by reducing the need for electricity in peak periods, where electricity is very expensive.

For short and unpredictable peaks, the storage management system can be allowed to overrule the energy control system temporarily turning of
20 non-essential energy using devices, but also more essential energy using devices such as fridge, freezer, oven, electric heaters to respond to the peak.

Figures:

25

Fig. 1: Schematic view of the controller according to the invention

Detailed description

30 Fig. 1 describes the basic idea of the invention, where four users (1) of one or a plural of energy consuming devices (4), the users (4) also referred to as residents (1) of a house (2), are at positions which are

distant from the house (2). 'House' is to be understood as any place where energy consuming devices (4) may be present. Each resident has a position identification device, such as a cell phone with GPS. The positions of the residents (1) are identified by tracking or tracing their position identification devices, e.g. by means of GPS positioned therein, or by simple triangulation to identify the position of the position identification devices relative to the antennas, as done by the telephone companies as a standard.

10 In the following the control of indoor temperature is used as an example, but any energy consuming device, and any combination of any number of energy consuming devices, also applies to the invention.

The device or devices (4) to be controlled or regulated may therefore be a HVAC system, but could alternatively or additionally be for example a TV, radio etc.

The indoor temperature is registered by a sensor. The energy control system comprises a controller (3) connected to all the residents (1) position identification devices enabling the controller (3) to alter the temperature, when the house is not occupied.

The controller (3) is simple to use and install, and may preferably be battery powered. A built-in radio frequency transmitter sends information to e.g. the radiator or floor heating thermostats all over the house (2).

Knowing the position of the residents (1) at any given time also makes it possible to predict residents (1) travelling speeds, and comparing the last known positions to the present locations, enabling the controller (3) to adjust not only the temperature of the house, but also the time in which the offset is increased or decreased.

The distance from the house to the nearest resident is used to determine the offset of the controller (3) ensuring that the indoor temperature is always at the desired level, when the house is occupied.

- 5 The use of individual controllers (3) makes it possible to keep different temperatures in the house (2) and still benefit from the energy savings by offsetting the temperature in the house (2) when it is not occupied, the controllers (3) will just offset from different temperatures.
- 10 As the controller (3) always knows the position of each household resident (1), then no programming is necessary, the controller (3) will alter the temperature accordingly.

- 15 The controller (3) in a preferred embodiment learns (possibly adaptively) the basic patterns of behaviour of the residents (1), enabling it with some degree of certainty to predict a following movement of a resident (1) given a specific behaviour, especially when the resident(s) arrive within some predetermined distance of the house (2). A plural of such basic patterns will be created, or mapped, for each resident (1), where such a map or
- 20 basic pattern is a plural of data sets, where a data set as at least position(s) of the residents(s) (1) and the time (at day, possibly also the calendar date). Optionally the estimated velocity of the resident(s) (1) also is included in the data(s) where the new data set(s) combined with at least one earlier resident data set (the at least two data sets) is used to choose
- 25 to which of the established maps or basic patterns of the resident(s) (1) the at least two data sets makes the best fit, using this map or basic pattern to estimate the following behaviour and thereby when the resident is expected to arrive back to the house (2).
- 30 The energy control system, or the controller (3) of the energy control system, always monitors the resident's location at a pre-determined frequency, being the frequency at which data sets are being established;

this frequency will gradually be reduced over time to a minimum as the energy control system device learns and creates the maps or resident's basic patterns of behaviour. This frequency will be increased when residents changes their basic pattern or just when they divert significantly from any of the known maps or basic patterns of behaviour, and will decrease again when a new pattern is learned or mapped, or the resident falls back to the previous or another of the basic patterns or maps. This feature will prolong the standby time of their position identification devices, like cell phones (GPS device or similar).

10

A plural of such predetermined distances to the house (2) may be defined, also called zones, possibly with individual zones being defined for each resident (1), and possibly determined automatically from their typical basic behaviours. These zones have individual different distances from the house (2) and may be used to establish how to weight the maps and/or predictions of behaviours, so that they are given an increasing weight or importance for a decreasing distance to the house (2).

A number of additional parameters may be included into the algorithm, such as any calendar and time data, or external or outdoor environmental conditions (6) (temperature, humidity, rainy conditions, time of day, time of month, time of year etc.), the indoor environmental conditions (7) (temperature, humidity etc.), also being used as feedback parameters, and predetermined (user predetermined) indoor set points (5), such as the preferred indoor temperature set point. Among the environmental conditions (6) and (7) could be air temperature and humidity, where such parameters can be used by an adaptive regulator to predict the time needed to for example re-cool/heat the house to the set point (5), and in general being parts of an algorithm being dynamic in time, the adjustments of the device(s) (4) depending as well on the behaviours of the residents (1) and on the surrounding indoor and outdoor conditions, and in a more

advanced embodiment, also for example on the weather forecast possibly received from the internet.

As an example, the energy control system thermostat will regulate the
5 temperature up or down (relative to a set point) according to the outdoor temperature, when all residents are away from household – and thereby enable energy savings. The off-set of temperature is regulated according to the shortest distance of resident to household combined with the maps learned by the energy control system device – ensuring that a set point
10 comfort temperature is reached before return of any household resident.

The system may further take other ambient environmental conditions like rain, snow, wind, humidity, into consideration, increasing the predictability of the time needed to reach the indoor comfort environment, hence
15 increasing the efficiency of the energy usage.

Other non-limiting examples of applications of the energy control system of the invention could be used is:

- 20 Regulating indoor lighting according to the amount of incoming sunlight. This will help save energy by actively increasing or decreasing the amount of reflected sunlight in relation to a more efficient cooling, heating of the building and optimized the indoor lighting.
- 25 Regulating of thermal load and the amount of air pollution (gases and the like given off by devices (4) for example when cooking in an oven) in the household to optimize the HVAC system according to the outdoor temperature, and the number of resident's present in the household present. The amount of air pollution is determined by the number of
30 persons in the house and the number of electrical equipment work. The energy control system can therefore regulate the air pollution by controlling the circulated, re-circulated air and turn off non-essential stand-

by equipment (TV, PC, DVD, entertainment centre, electric tooth brush etc).

5 The energy control system may comprise micro switches, which can also be used to start and stop both essential and non-essential electric equipment fully automatically or by remote activation (e.g. from cell phone), where such equipment devices (4) could be washing machines, pre-heat pool etc..

10 In an further advanced embodiment of the invention, the energy control system comprises a peak load manager (8) combined with the energy control system controller (3) , where the peak load manager (8) controls an energy reservoir device (9) supporting minimizing peak load disturbance on the electricity grid. This is done, regardless if the household is occupied
15 or not. The temperature of the household is decreased or increased, depending on outdoor conditions; prior to the peak (predictable peaks).By doing this, the household can maintain a comfortable indoor climate for a longer period of time increasing the on/off hysteresis, using the household as an energy accumulator.

20 In case of unpredictable peaks on the power grid, the non-essential stand-by equipment can be turned off for a longer time frame and essential equipment (freezer, refrigerator, AC, etc.) for a short time frame, thereby reducing the load on the electricity grid.

25 Any number of imaginable devices and systems may be controlled and/or regulated by the energy control system of the present invention.

30 One example is that the energy control system may automatically ensure the switching on of the burglar alarm.

As an additional feature, the energy control system may comprise a 'family finder' that can provide the location of any resident's cell phone upon request.

- 5 The separate devices of this invention are preferably standard devices as they are known in the art, such as the controller (3) and the peak load manager (8) preferably being computer micro chips with a software, and the energy reservoir devices (9) preferably are batteries of any kind known in the art. The needed data transfers, such as information's and
- 10 instructions for the devices (4), the controller (8), the peak load manager (8) etc. may be by wire or wireless, and may be transferred by the telephone net or by internet or any other known system for transferring such data.

Claims:

1. Method of regulating the energy consumption of a device (4), the
5 method comprising the regulation of the energy consuming device (4) in
dependence of the position of the user (1) of the device (4), wherein this
position is used to calculate the distance between the device (4) and the
user (1).
- 10 2. Method according to claim 1, wherein the position of the user (1) and
the time of day gives a data set, and where such data sets are used to
generate maps of the typical daily behaviours of said users (1), said maps
thus being a plural of data sets, and where the maps are used to estimate
the users (1) following behaviour and regulates the device(s) (4) based on
15 this estimate.
3. Method as in claim 2, wherein the position of the user is registered
through a cell phone or a mobile phone, either by triangulation or by a
built-in GPS in the cell phone or mobile phone.
- 20 4. Method as in claim 3, wherein the velocity of the user (1) relative to the
device is also a part of the regulation.
5. Method as in claim 1, wherein external and internal environmental
25 conditions to the house (2) also are used to regulated the energy
consuming device(s) (4), such as humidity, temperature, rainy conditions,
cloudiness etc.
6. Method a in any of the preceding claims, wherein the method further
30 stores energy in energy reservoirs (9) prior to predictable peaks in the
power grid and uses this energy to run the energy consuming device(s) (4)
during the predictable peak.

7. An energy control system to regulate the energy consumption of energy consuming device(s) (4), the energy control system comprising;

- at least one portable position identification device being worn by at
- 5 least one user (1) of the energy consuming device(s) (4) ,
- a controller (3),

Wherein said controller (3) at a frequency acquires and generates a data set for each portable position identification device, the data set at least comprising the present geographic position and the time of day, whereby

10 the portable identification devices moves, and where such data sets are used to generate maps of the typical daily behaviours of said users (1), said maps being a collection of data sets, and where the maps are used to estimate the users (1) following behaviour and regulates the device(s) (4) based on this estimate.

15

8. Energy control system as in claim 5, wherein the system further comprises a peak load manager (8) controlling an energy reservoir device (9).

20 9. Energy control system according to claim 6 or 7, wherein the energy control system is connected to the telephone net and/or the internet, receiving information being used by the controller (3).

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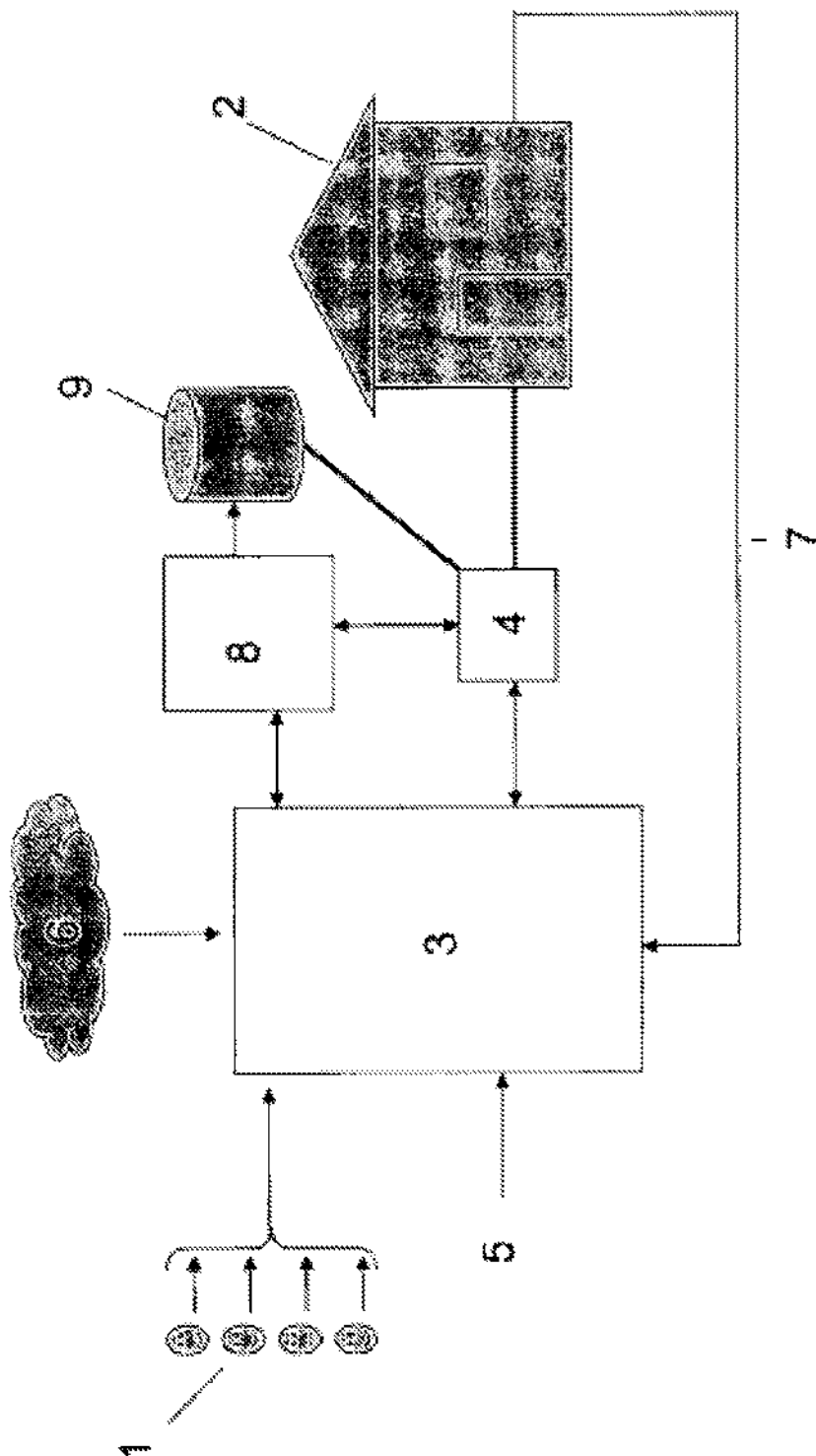


Fig. 1

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(7E) Applicant *(for oil designated Master energy USE)* EN-PHASE ENERGY, INC. (US/US): 201 1st Street Santa ME, Petaling, California 94025 (US).

(73) investors and

(75) *Insectura*: *Applisaura* (*pne.*) U.S. nat. h., LEE, Los Angeles 1934; 402. *Buellanda* Court, Nauseland, California 1968-1969; ZAZZERA-HALL, Ben 1983(8); 7196. *Lyncha* Brand, Schenck, California 19472 (USA). *ASBO*, Magnus (RUS-LS) 4 Tiddem Lane, Pasadena, California 1968-1969.

(74) Agent: REUSEH, Robert M.; Minor IP Law Group, PBO
Brook Street, Suite 201, Shrewsbury, New Jersey 07702
 (201)

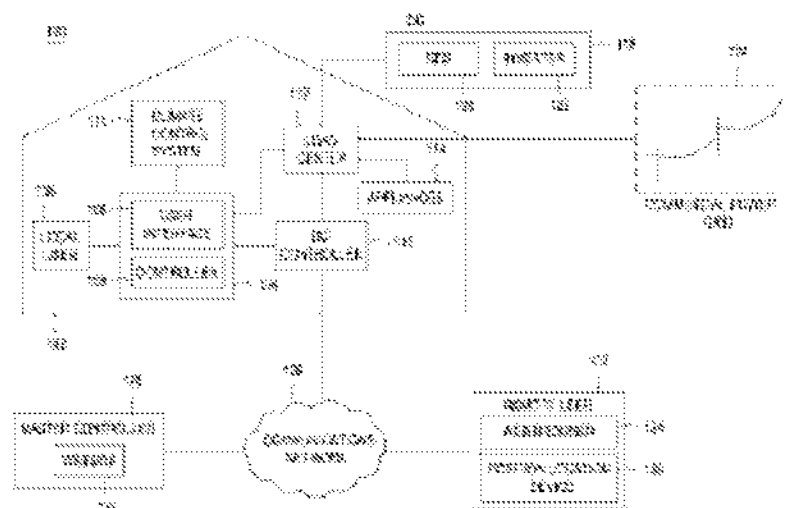
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1.54 THE METHOD AND APPARATUS FOR CLIMATE CONTROL



(27) **Abstract:** A method and apparatus for controlling climate within a building. In one embodiment, the apparatus comprises a smart climate unit for (i) obtaining distributed generation (DG) information pertaining to operation of a DG that generates power for the building, and (ii) controlling at least one climate condition within the building based on at least one of the DG information, local input, or remote input.

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METHOD AND APPARATUS FOR SMART CLIMATE CONTROL**BACKGROUND OF THE INVENTION****Field of the Invention**

[0001] Embodiments of the present disclosure relate generally to climate control within a building, and, in particular, smart climate control within the building.

Description of the Related Art

[0002] Current worldwide growth in demand for energy is leading to a durable increase in energy usage and a rapid depletion of existing fossil fuels to supply the required energy. Many of today's energy users are in search of ways to utilize energy more efficiently and limit their overall energy consumption. In some cases, energy users may employ distributed generators (DGs) for harvesting power from renewable energy sources, such as solar, wind, hydro, or the like, in order to offset their usage of energy derived from fossil fuels.

[0003] For many energy users, climate control within residential and commercial buildings, i.e., heating, air conditioning, humidity control, and the like, represents one of the largest areas of energy consumption. Given that many buildings are unoccupied over extended periods of time, such as during daytime hours when homeowners are away from their homes or evening hours when workers are away from their businesses, appropriately managing the climate within a building during such times provides an opportunity to reduce energy consumption.

[0004] Therefore, there is a need in the art for a method and apparatus for efficiently controlling a climate within a building.

SUMMARY OF THE INVENTION

[0005] Embodiments of the present invention generally relate to a method and apparatus for controlling climate within a building. In one embodiment, the apparatus comprises a smart climate unit for (i) obtaining distributed generator (DG) information pertaining to operation of a DG that generates power for the building, and (ii) controlling at least one climate condition within the building based on at least one of the DG information, local input, or remote input.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0006] So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

[0007] Figure 1 is a block diagram of a system employing smart climate control in accordance with one or more embodiments of the present invention;

[0008] Figure 2 is a block diagram of a smart climate unit controller in accordance with one or more embodiments of the present invention;

[0009] Figure 3 is a block diagram of a distributed generator (DG) controller in accordance with one or more embodiments of the present invention;

[0010] Figure 4 is a depiction of a smart climate unit in accordance with one or more embodiments of the present invention;

[0011] Figure 5 is a block diagram of a method for smart climate control in accordance with one or more embodiments of the present invention; and

[0012] Figure 6 is a block diagram of a method for location-based climate control in accordance with one or more embodiments of the present invention.

DETAILED DESCRIPTION

[0013] Figure 1 is a block diagram of a system 100 employing smart climate control in accordance with one or more embodiments of the present invention. This diagram only portrays one variation of the myriad of possible system configurations. The present invention can function in a variety of environments and systems.

[0014] The system 100 comprises a building 102, such as a residential or commercial building, coupled to a distributed generator (DG) 118 and a commercial

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power grid 124. The building 102 comprises a smart climate unit 104, a climate control system 110, a load center 112, one or more appliances 114, and a DG controller 116. The commercial power grid 124 is coupled to the appliances 114 via the load center 112 for providing power to the appliances 114.

[0015] The DG system 119 comprises a renewable energy source (RES) 120 coupled to an inverter 122. The RES 120 may be any type of system for generating DC power from a renewable form of energy, such as wind, solar, hydro, and the like. The inverter 122 converts the generated DC power to AC power that is commercial power grid compliant and couples the AC power to the load center 112. The generated AC power may be further coupled from the load center 112 to the one or more appliances 114 and/or to the commercial power grid 124. Additionally or alternatively, generated energy may be stored for later use; for example, the generated energy may be stored utilizing batteries, heated water, hydro pumping, H₂O-to-hydrogen conversion, or the like.

[0016] In some embodiments, the inverter 122 may be a plurality of inverters utilized to convert the DC power from the RES 120 to AC power; for example, the RES 120 may comprise a plurality of photovoltaic (PV) modules where each PV module is coupled to an inverter in a one-to-one correspondence. Additionally, one or more DC/DC converters may be utilized within the DG 118, for example, coupled between the RES 120 and the inverter 122.

[0017] The DG controller 116 is coupled to the load center 112 and provides operational control of the DG 118 via the inverter 122. In some embodiments, the DG controller 116 provides such control utilizing power line communication (PLC) to communicate with the DG 118; additionally or alternatively, the DG controller 116 may utilize other types of wired and/or wireless techniques for communicating with the DG 118. The DG controller 116 is further communicatively coupled to a master controller 128 via a communications network 126 (e.g., the Internet) for sending information to/receiving information from the master control 128 pertaining to the operation of the DG 118. The DG controller 116 may utilize wired and/or wireless techniques for coupling to the communications network 126; in some embodiments,

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the DG controller 116 may be coupled to the communications network 126 via a commercially available router.

[0018] In accordance with one or more embodiments of the present invention, the smart climate unit 104 is coupled to the climate control system 110 for driving the climate control system 110 to control the climate (heating, cooling, humidity, heat pump activity, and the like) within the building 102. The smart climate unit 104 provides status displays (e.g., current temperature, humidity level, settings, and the like) and user-controls locally and remotely to allow both local and remote users to gauge current climate conditions and settings and make adjustments as needed. Additionally, the smart climate unit 104 provides location-based control of the climate control system 110 (i.e., control of the climate control system 110 based on the locations of one or more users). The smart climate unit 104 is further coupled to the DG controller 116 for obtaining information related to the operation of the DG 118 (e.g., power production information). The smart climate unit 104 may then utilize such DG information to control the climate within the building 102.

[0019] The smart climate unit 104 may be wall mounted or positioned on a desk, table, or the like, and comprises a user interface 106 and a smart climate unit controller 108. The controller 108 provides local control of the smart climate unit 104 via the user interface 106. In some embodiments, the smart climate unit 104 may comprise an available (i.e., "off the shelf") thermostat device which, for example, comprises components such as a microprocessor and memory, and is suitably modified in accordance with the invention described herein.

[0020] The user interface 106 provides display capabilities (e.g., to display current status, settings, time of use rates, or the like) and user controls for operatively controlling the smart climate unit 104, for example, by touch screen, buttons, knobs, or the like. Additionally or alternatively, the smart climate unit 104 may be directly coupled to a display and/or an input/output device, such as a personal computer, personal digital assistant, or the like, for providing the user interface 106. In such embodiments, the smart climate unit 104 may be coupled to

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the device by wired techniques or wireless techniques, for example utilizing standards such as IEEE 802.11, Zigbee, Z-Wave, or the like.

[0021] The user interface 106 allows a local user 138 to configure the smart climate unit 104 for initial use and to manually change current settings of the smart climate unit 104 (e.g., increase current temperature, decrease current humidity, or the like). Additionally, the local user 138 may, via the user interface 106, generate and/or change one or more climate control profiles utilized by the smart climate unit 104 for operating the climate control system 110. Such climate control profiles may specify climate control parameters (e.g., preferred temperature, humidity, heat pump settings, and the like) based on criteria such as time, energy mode, user preference, user location, weather conditions, and the like. For example, time-based climate control profiles may specify settings that are based on time of day, day of week, month of year, groupings of certain hours and/or days (e.g., waking/sleeping time, working from home, pet-sitting, vacation periods, holidays), and the like. Energy mode-based climate control profiles may specify settings that are based on criteria related to energy usage, such as energy saver mode, time of use (TOU) rates, current energy consumption, supply conditions (e.g., energy production by the DG 118), peak energy consumption times, and the like. User preference-based climate control profiles may specify preferred settings for one or more users. Location-based climate control profiles may specify settings that are based on proximity of one or more users and/or current travel speed of the one or more users. Weather-based profiles may specify settings that are based on current and/or predicted weather conditions. The smart climate unit 104 may provide a "wizard" function for assisting the local user 138 to initially configure, program, and/or operate the smart climate unit 104.

[0022] In addition to providing the local control functionality described above, the controller 108 provides remote control of the smart climate unit 104, allowing a remote user 132 to remotely obtain analogous displays and control for the smart climate unit 104. The smart climate unit controller 108 is communicatively coupled to the communications network 126 such that the remote user 132 may utilize a conventional web browser 134 to remotely access and operate the smart climate

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unit 104. For example, the remote user 132 may access a website 130 supported by the master controller 128 (or a server having access to the master controller 128) to access the smart climate unit 104 via a password protected portal. The remote user 132 may then execute control of the smart climate unit 104 as if the remote user 132 were local to the smart climate unit 104. For example, the remote user 132 may perform initial configuration of the smart control unit 104 (e.g., utilizing the "wizard"), change current settings of the smart climate unit 104, create new or change existing climate control profiles for the smart climate unit 104, or similarly operate the smart climate unit 104. The remote user 132 may access the smart climate unit 104 in such a manner utilizing any suitable device that provides the web browser 134, such as a smart cell phone, a personal digital assistant, a personal computer, or the like. Additionally, the website 130 may support a plurality of smart climate units 104 deployed within other areas of the building 102 (e.g., different floors) or other buildings.

[0023] The smart climate unit controller 108 further provides location-based climate control for the building 102 based on a location of one or more users. For example, the controller 108 may provide climate control for the building 102 based on a location of the remote user 132. In some embodiments, the smart climate unit controller 108 utilizes a position location device 136 as a proxy for determining a location of the remote user 132 and operating the climate control system 110 based on the determined location. The position location device 136 may be any device for locating people and/or assets, e.g., a cell phone, a global positioning system (GPS), a personal digital assistant, ON-STAR service, or the like. For example, the smart climate unit controller 108 may determine the location of the remote user's cell phone utilizing a global positioning satellite (GPS) receiver of the cell phone, cell-triangulation features of the cell phone, or the like. The smart climate unit controller 108 may then drive the climate control system 110 to suitably adjust the temperature and/or humidity within the building 102 based on the determined location of the remote user 132. For example, the smart climate unit controller 108 may leverage existing site information, such as an address of the building 102, to control the

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climate control system 110 based on the remote user's proximity to the building 102 as well as speed of approaching the building 102.

[0024] In order to determine appropriate climate settings for the building 102 based on the location of the remote user 132, the smart climate unit controller 108 may maintain one or more location-based climate control profiles associated with the remote user 132. For example, the location-based climate control profiles may specify that air conditioning be turned on when the remote user 132 (i.e., utilizing the position location device 136 as a user-proxy) is within a predefined distance of the building 102, that a certain temperature and/or humidity level be maintained when the remote user 132 is within the building 102, or the like. The smart climate unit controller 108 may additionally factor in travel speed of the remote user 132 in addition to the remote user's distance from the building 102 for suitably operating the climate control system 110. The smart climate unit controller 108 may also maintain location-based climate control profiles for additional users (such as the local user 138) and/or groups of users (such as a family group), utilizing corresponding cell phones/other wireless portable devices as proxies for the additional users. The smart climate unit 104 may utilize the location of each user at a particular time to affect settings. For example, if a wife is home alone, her personal climate control profile will prevail, while if one or more family members are home, a "family" climate control profile will prevail.

[0025] In addition to providing local and remote programming capabilities, the smart climate unit 104 also provides climate and/or energy consumption data, statistics, and/or reports both locally and remotely. For example, the smart climate unit 104 may provide reports of climate control statistics during pre-defined or user-defined periods (e.g., total hours cooling, total hours heating, or the like) and/or energy related statistics (e.g., energy saver mode hours, energy consumption for cooling, energy consumption for heating, or the like). Such data, statistics, and/or reports may be displayed via the user interface 106 and/or the web browser 134, for example, as bar charts, pie charts, in spreadsheet format, or the like, as well as stored for future use. In some embodiments, the smart climate unit 104 may be coupled to a local printer for printing out desired reports/statistics and/or may allow

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for downloading of report data in various formats, such as Comma Separated Values (CSV) format, for further analysis.

[0026] In some embodiments, the smart climate unit 104 may regulate energy consumption utilizing demand management. For example, based upon supply conditions, such as energy production by the DG 118, peak energy consumption times, time of use (TOU) rates, or the like, the smart climate unit 104 may optimally control the climate control system 110 for achieving a desired level of energy consumption (e.g., optimizing energy consumption versus cost), as well as control consumption decisions, energy storage decisions, or the like. Further, the smart climate unit 104 may additionally or alternatively control the climate control system 110 based on externally generated requests to regulate energy consumption. For example, the smart climate unit 104 may receive a request from an electric company (e.g., communicated via the powerline or the communications network 126) to regulate energy consumption in order to assist with peak load balancing; the smart climate unit 104 may then control the climate control system 110 accordingly. Additionally, the smart climate unit 104 may access current and/or predicted weather-related information, for example at weather websites via the communications network 126, and/or comprise weather-related sensors, and utilize such information for controlling the climate control system 110. For example, the smart climate unit 104 may evaluate potential power generation by the DG 118 based on current and/or predicted weather conditions and factor such information into establishing settings for the climate control system 110. The smart climate unit 104 may further utilize weather-related information to “learn” timeframes for adjusting temperature and/or humidity within the building 102, for example, based on external weather conditions. The smart climate unit 104 may then factor in the learned timeframes when operating the climate control system 110, for example, during application of any of the climate control profiles.

[0027] In some alternative embodiments, the appliances 114 may comprise one or more “smart” appliances that are controlled by the smart climate unit 104, for example, based on energy consumption, TOU rates, user proximity, or the like.

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[0028] Figure 2 is a block diagram of a smart climate unit controller 108 in accordance with one or more embodiments of the present invention. The smart climate unit controller 108 comprises a transceiver 202 communicatively coupled to the DG controller 116. The transceiver 202 may utilize wireless (e.g., based on standards such as IEEE 802.11, Zigbee, Z-wave, or the like) and/or wired communication techniques for such communication.

[0029] The transceiver 202 is further coupled to at least one central processing unit (CPU) 204, and the CPU 204 is additionally coupled to support circuits 206 and a memory 208. The CPU 204 may comprise one or more conventionally available microprocessors. Alternatively, the CPU 204 may include one or more application specific integrated circuits (ASIC). The support circuits 206 are well known circuits used to promote functionality of the CPU 204. Such circuits include, but are not limited to, a cache, power supplies, clock circuits, buses, network cards, input/output (I/O) circuits, and the like.

[0030] The memory 208 may comprise random access memory, read only memory, removable disk memory, flash memory, and various combinations of these types of memory. The memory 208 is sometimes referred to as main memory and may, in part, be used as cache memory or buffer memory. The memory 208 generally stores an operating system (OS) 210 of the smart climate unit controller 108. The OS 210 may be one of a number of available operating systems for microcontrollers and/or microprocessors. In some embodiments where the smart climate unit 104 comprises a commercially available thermostat device, the OS 210 may be a default OS of the thermostat device.

[0031] The memory 208 may store various forms of application software, such as a smart climate unit control module 212 for operatively controlling the smart climate unit 104 as previously described with respect to Figure 1. Additionally, the memory 208 may store data 214 related to the operation of the smart climate unit 104. Such data may include climate control profiles for operating the climate control system 110 (e.g., profiles that are time-based, user location-based, user preference-based, or energy mode-based); archived statistics and/or reports for climate control data,

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energy consumption/production data, and/or weather related data; learned climate control behaviors (e.g., timeframes for temperature and/or humidity adjustments or the like); and/or any other data related to the operation of the smart climate unit 104. Additionally, the data 214 may include data pertaining to the operation of the DG 118, for example, for use in demand management control of the climate control system 110.

[0032] Figure 3 is a block diagram of a DG controller 116 in accordance with one or more embodiments of the present invention. The DG controller 116 comprises a transceiver 302 communicatively coupled to the smart climate unit controller 108 as well as the communications network 126. The transceiver 302 may utilize wireless (e.g., based on standards such as IEEE 802.11, Zigbee, Z-wave, or the like) and/or wired communication techniques for such communication; in some embodiments, the DG controller 116 may be coupled to the communications network 126 via a commercially available router.

[0033] The transceiver 302 is further coupled to at least one central processing unit (CPU) 304, and the CPU 304 is additionally coupled to support circuits 306 and a memory 308. The CPU 304 may comprise one or more conventionally available microprocessors. Alternatively, the CPU 304 may include one or more application specific integrated circuits (ASIC). The support circuits 306 are well known circuits used to promote functionality of the CPU 304. Such circuits include, but are not limited to, a cache, power supplies, clock circuits, buses, network cards, input/output (I/O) circuits, and the like.

[0034] The memory 308 may comprise random access memory, read only memory, removable disk memory, flash memory, and various combinations of these types of memory. The memory 308 is sometimes referred to as main memory and may, in part, be used as cache memory or buffer memory. The memory 308 generally stores an operating system (OS) 310 of the DG controller 116. The OS 310 may be one of a number of available operating systems for microcontrollers and/or microprocessors, such as, but not limited to, but not limited to, SOLARIS from SUN Microsystems, Inc., AIX from IBM Inc., HP-UX from Hewlett Packard

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Corporation, LINUX from Red Hat Software, Windows 2000 from Microsoft Corporation, and the like.

[0035] The memory 308 may store various forms of application software, such as a DG control module 312 for operatively controlling the DG 118 (i.e., via the inverter 122). Additionally, the memory 308 may store data 314 related to the operation of the DG 118, such as power production data or the like. The DG controller 116 may provide at least a portion of the data 314 to the smart climate unit controller 108 for use in operating the climate control system 110 as previously described.

[0036] The master controller 128 (not shown) is a type of controller, analogous to the DG controller 116, which may contain additional elements, such as application software for managing a plurality of DGs 118 as well as application software for managing the website 130.

[0037] Figure 4 is a depiction of a smart climate unit 104 in accordance with one or more embodiments of the present invention. The display interface 106 of the smart climate unit 104 comprises user controls 402 for adjusting settings of the smart climate unit 104. The user controls 402 may include buttons, knobs, touch screen features, or the like, for obtaining menus for operating the smart climate unit 104, displaying climate control related information (e.g., TOU rates, external weather conditions, energy consumption, or the like), increasing or decreasing current temperature and/or humidity levels, creating climate control profiles, viewing/changing saved information (such as any of the data 214), and controlling other features of the smart climate unit 104.

[0038] The display interface 106 additionally comprises a date/time display 404 for displaying the current date and/or time; a climate status display 406 for displaying information related to the current climate of the building 102 as well as current settings, such as current temperature and/or humidity, target temperature and/or humidity, current operating mode (e.g., heat, air conditioning), or the like.

[0039] The display interface 106 further comprises an energy mode display 408 for displaying information related to the current energy mode (e.g., current mode is

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normal or energy saver, current cost per kilowatt hour, or the like); a communications status indicator 410 for displaying the current status of the communications link, for example, to the DG controller 116; and an energy usage display 412 for displaying information pertaining to current energy consumption (e.g., power status is low/normal/high, cost per kilowatt hour, or the like). The display interface 106 may further comprise additional controls for operating the smart climate unit 104 and/or additional displays for presenting information related to the smart climate unit 104 as previously described.

[0040] Figure 5 is a block diagram of a method 500 for smart climate control in accordance with one or more embodiments of the present invention. In some embodiments, such as the embodiments described below, a smart climate unit is located within a commercial or residential building for locally and/or remotely operating a climate control system (e.g., to control temperature, humidity, heat pump activity, or the like) of the building (e.g., the smart climate unit 104 within the building 102 for driving the climate control system 110). The smart climate unit may further be coupled to a DG controller for receiving information pertaining to the operation of a DG that supplies power to the building, and the smart climate unit may utilize such information when operating the climate control system. Additionally, the DG controller may be coupled to a master controller, a remote user, or the like, via a communications network such as the Internet.

[0041] The method 500 begins at step 502 and proceeds to step 504, where a user desires to access the smart climate unit. If the user is within the building, the user may locally access the smart climate unit and the method 500 proceeds to step 506; alternatively, if the user is remotely located, the user may remotely access the smart climate unit and the method 500 proceeds to step 508. At step 506, the user may locally access the smart climate unit via a user interface of the smart climate unit, such as a touch screen display, buttons, knobs, or the like. Additionally or alternatively, the smart climate unit may be coupled to a separate display and/or input/output device, such as a personal computer, a personal digital assistant, or the like, for presenting a user interface to the user.

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[0042] At step 508, the remotely located user may log in to the smart climate unit via a conventional web browser, for example as previously described with respect to Figure 1. The user may log in to the smart climate unit utilizing any suitable device that supports the web browser, such as a smart cell phone, a personal computer, a personal digital assistant, or the like. In some embodiments, the user may log in to the smart climate unit via a password protected portal.

[0043] Once the user has accessed the smart climate unit locally at step 506 or remotely at step 508, the method 500 proceeds to step 510. At step 510, a determination is made whether the user is performing an initial configuration of the smart climate unit. If the result of the determination at step 510 is yes, the method 500 proceeds to step 512 where the user performs the initial configuration. As part of the initial configuration, the user may manually set climate-related parameters to adjust current conditions (e.g., desired temperature, humidity) as well as generate one or more climate control profiles which may be stored within the smart climate unit for automatically operating the smart climate unit. Such profiles may specify climate control settings (e.g., preferred temperature, humidity, heat pump settings, and the like) based on criteria such as date/time, energy mode, user preference, user location, weather conditions, and the like. For example, time-based profiles may specify settings based on time of day, day of week, month of year, groupings of certain hours and/or days (e.g., waking/sleeping time, working from home, pet sitting, vacation periods, holidays), and the like. Energy mode-based profiles may specify settings that are based on criteria related to energy usage, such as energy saver mode, TOU rates, current energy consumption, supply conditions (e.g., energy production by a DG providing power to the building), peak energy consumption times, and the like. User preference-based profiles may specify preferred settings for one or more users. Location-based profiles may specify settings based on proximity of one or more users and/or current travel speed of the one or more users. Weather-based profiles may specify settings that are based on current and/or predicted weather conditions.

[0044] The smart climate unit may provide a "wizard" functionality for assisting the user during the initial configuration as well as during subsequent operation.

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Once the initial configuration of the smart climate unit is completed, the method 500 proceeds to step 522. If, at step 510, the result of the determination is no, the method 500 proceeds to step 514. At step 514, the user may decide to change current settings of the smart climate unit and the method 500 proceeds to step 516; program the smart climate unit and the method 500 proceeds to step 518; or generate/access reports from the smart climate unit and the method 500 proceeds to step 520. The smart climate unit wizard may assist the user at any of the steps 516, 518, or 520.

[0045] At step 516, the user may adjust any of the current settings of the smart climate unit, such as temperature, humidity level, heat pump operation, energy mode, or the like; additionally, the user may activate/terminate any of the climate control profiles. The method 500 then proceeds to step 522.

[0046] At step 518, the user may create new or modify existing climate control profiles. The method 500 then proceeds to step 522.

[0047] At step 520, the user may generate current data and/or reports, as well as access archived data and/or reports, related to the operation of the smart climate unit. Such data and/or reports may be presented as pie charts, bar charts, spreadsheets, or the like, and may include information pertaining to climate control statistics during pre-defined or user-defined periods (e.g., total hours cooling, total hours heating, or the like); energy related statistics (e.g., energy saver mode hours, energy consumption for cooling, energy consumption for heating, or the like); current and/or predicted weather conditions; learned climate control behaviors (e.g., timeframes for temperature and/or humidity adjustments or the like); and/or any other data related to the operation of the smart climate unit. Additionally, the user may obtain data and/or reports pertaining to the operation of a distributed generator (DG) that provides power for the building, for example, as related to the operation of the smart climate unit.

[0048] The user may save generated data and/or reports within the smart climate unit; in some embodiments, the smart climate unit may be locally coupled to a separate storage device for storing data and/or reports and/or a printer for printing desired data and/or reports. The method 500 then proceeds to step 522.

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[0049] At step 522, the smart climate unit controls the building's climate control system based upon the user's settings (i.e., manual settings and/or climate control profiles). In some embodiments, the smart climate unit may additionally regulate energy consumption utilizing demand management. For example, based upon supply conditions, such as energy production by a DG coupled to the building, peak energy consumption times, TOU rates, or the like, the smart climate unit may optimally control the climate control system for achieving a desired level of energy consumption (e.g., optimizing energy consumption versus cost). Further, the smart climate unit may additionally or alternatively control the building's climate control system based on externally generated requests to regulate energy consumption. For example, the smart climate unit may receive a request from an electric company (e.g., communicated via the powerline or the communications network) to regulate energy consumption in order to assist with peak load balancing; the smart climate unit may then control the climate control system accordingly. At step 524, a determination is made whether to continue. If the result of such determination is yes, the method 500 returns to step 514; if the result of such determination is no, the method 500 proceeds to step 526 where it ends.

[0050] Figure 6 is a block diagram of a method 600 for location-based climate control in accordance with one or more embodiments of the present invention. In some embodiments, such as the embodiment described below, a smart climate unit (e.g., the smart climate unit 104) is located within a residential or commercial building for operating the climate control system (e.g., to control temperature, humidity, heat pump activity, or the like) of the building. The smart climate unit contains one or more location-based climate control profiles (e.g., the climate control profiles previously described) for automatically operating the smart climate unit based on pre-set preferences of one or more users who access the building. The smart climate unit may further be coupled to a DG controller for receiving information pertaining to the operation of a DG that supplies power to the building, and the smart climate unit may utilize such information when operating the climate control system.

[0051] The method 600 starts at step 602 and proceeds to step 604. At step 604, the smart climate unit communicates with one or more position location devices

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for determining locations of each applicable user. A position location device may be any device for locating people and/or assets, e.g., a cell phone, a global positioning system (GPS), a personal digital assistant, ON-STAR service, or the like. The smart climate unit obtains information from the position location device or devices, such as longitude and latitude coordinates, for determining the location of the one or more users.

[0052] The method 600 proceeds to step 606, where the smart climate unit determines a current location for each applicable user based on the position information obtained from the position location device or devices. For example, a user's cell phone number may be entered as part of their location-based climate control profile. The smart climate unit may then obtain position information that identifies a current position of the user's cell phone, for example, based on a global positioning satellite (GPS) receiver of the cell phone, cell-triangulation features of the cell phone, or the like. The smart climate unit utilizes the positioning information to determine a current location of the cell phone as a proxy for the user's location.

[0053] The smart climate unit may determine the user's location as an absolute position, e.g., a position based on longitude and latitude, other types of absolute coordinates, landmarks, or the like. Additionally or alternatively, the user's position may be determined as a relative position; for example, the user's distance from the building may be determined based on existing site information, such as an address of the building stored within the smart climate unit. As part of determining the user's current location, the smart climate unit may access databased information, such as addresses, information pertaining to landmarks, coordinates, or the like.

[0054] The smart climate unit may additionally determine a travel speed of the user; for example, the smart climate unit may obtain the travel speed from the position location device, compute the travel speed based on position information obtained from the position location device, or determine the travel speed by other techniques.

[0055] The method 600 proceeds to step 608. At step 608, location-based climate control profiles corresponding to the applicable users are accessed. The

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location-based climate control profiles may be stored within the smart climate unit and/or external to the unit, and comprise desired climate settings (e.g., temperature, humidity, and/or heat pump control) for the users along with rules for operating the climate control system based on the locations of the users. For example, a first user's climate control profile may specify a preferred temperature and humidity setting, and may specify that the climate control system be activated to generate the desired temperature and humidity when the first user is within a certain number of miles of the building.

[0056] The method 600 proceeds to step 610, where the smart climate unit correlates the accessed location-based climate control profile information with the current user locations for determining suitable operative control of the climate control system. In some embodiments, the smart climate unit may "learn" timeframes required to reach certain temperature and/or humidity levels within the building, for example, based on external and/or predicted weather conditions, and factor in such learned information when operating the climate control system. At step 612 the smart climate unit operates the climate control system accordingly to adjust the building's climate based on the user locations. The smart climate unit may continually coordinate information (e.g., location data, user travel speed data, location-based climate control profile data) for a plurality of users at a plurality of different locations to optimally control the climate control system based on each user's location and preferences.

[0057] The method 600 then proceeds to step 614 where it ends.

[0058] The foregoing description of embodiments of the invention comprises a number of elements, devices, circuits and/or assemblies that perform various functions as described. These elements, devices, circuits, and/or assemblies are exemplary implementations of means for performing their respectively described functions.

[0059] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing

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from the basic scope thereof, and the scope thereof is determined by the claims that follow.

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CLAIMS:

1. An apparatus for controlling climate within a building, comprising:
a smart climate unit for (i) obtaining distributed generator (DG) information pertaining to operation of a DG that generates power for the building, and (ii) controlling at least one climate condition within the building based on at least one of the DG information, local input, or remote input.
2. The apparatus of claim 1, wherein the smart climate unit controls the at least one climate condition based on at least one of a climate control profile or a location of a user.
3. The apparatus of claim 2, wherein the climate control profile specifies at least one climate control setting based on at least one of time, energy mode, user preference, user location, or weather information.
4. The apparatus of claim 2, wherein the smart climate unit controls the at least one climate condition based on a travel speed of the user.
5. The apparatus of claim 2, wherein the smart climate unit determines the location of the user based on a position location device.
6. The apparatus of claim 1, wherein the smart climate unit controls the at least one climate condition using demand management.
7. The apparatus of claim 1, wherein the smart climate unit learns climate control information over time and uses the learned climate control information for controlling the at least one climate condition.
8. The apparatus as in any of claims 1-7, further comprising the DG.
9. A method for controlling climate within a building, comprising:

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receiving distributed generator (DG) information pertaining to the operation of a DG that couples power to the building;

determining at least one setting for controlling at least one climate condition within the building based on at least one of the DG information, local input, or remote input; and

operating a climate control system of the building based on the at least one setting.

10. The method of claim 9, wherein the at least one setting is determined based on at least one of a climate control profile or demand management.

11. The method of claim 10, wherein the climate control profile specifies the at least one setting based on at least one of time, energy mode, user preference, user location, or weather information.

12. The method of claim 9, further comprising determining a location of a user, wherein the at least one setting is determined based on the location.

13. The method of claim 12, further comprising determining a travel speed of the user, wherein the at least one setting is further determined based on the travel speed.

14. The method of claim 12, further comprising receiving position information corresponding to a position location device, wherein the location is determined based on the position information.

15. The method of claim 9, further comprising learning climate control information over time, wherein the at least one setting is determined based on the learned climate control information.

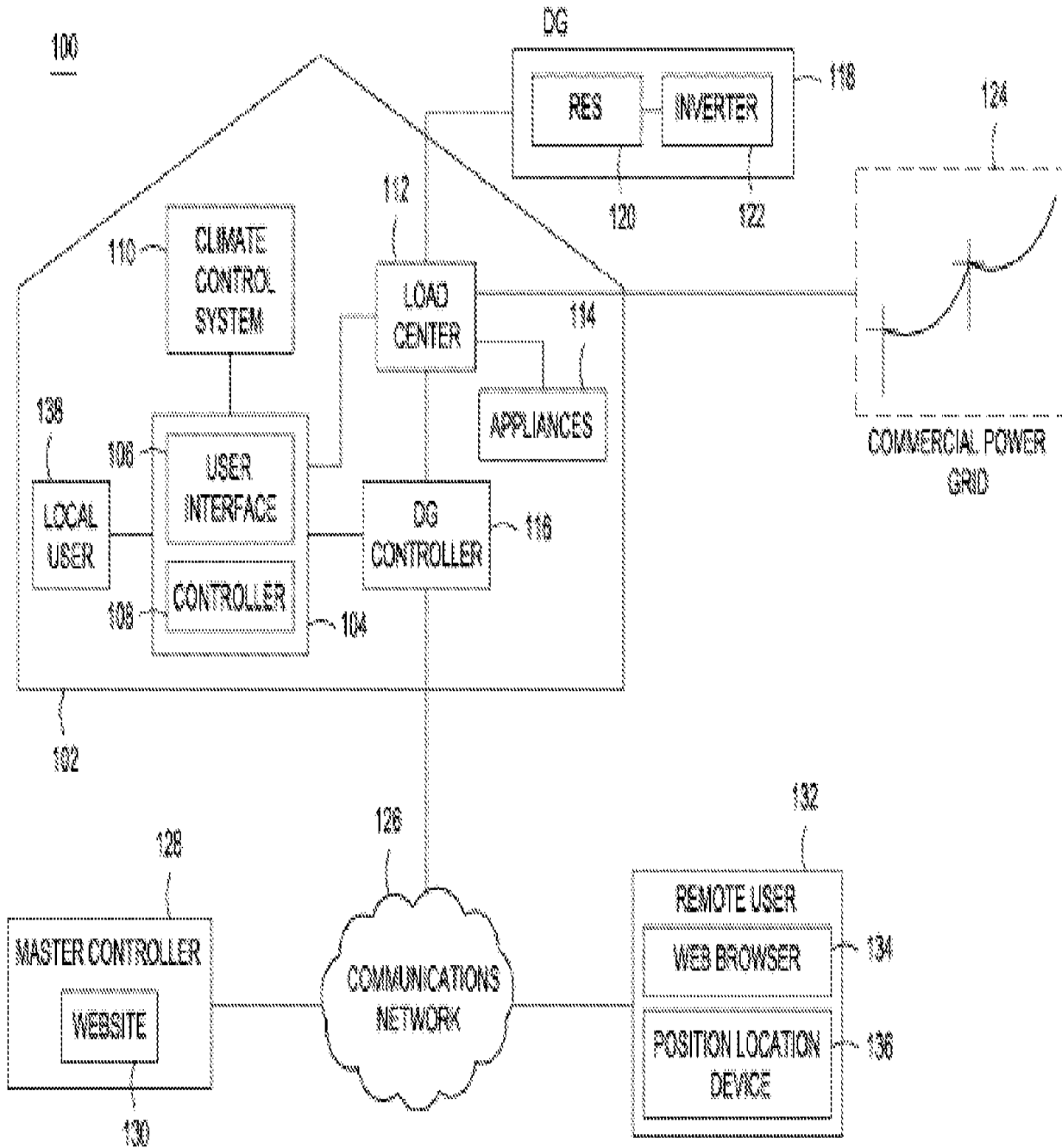


FIG. 1

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FIG. 1 (continued)

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FIG. 2

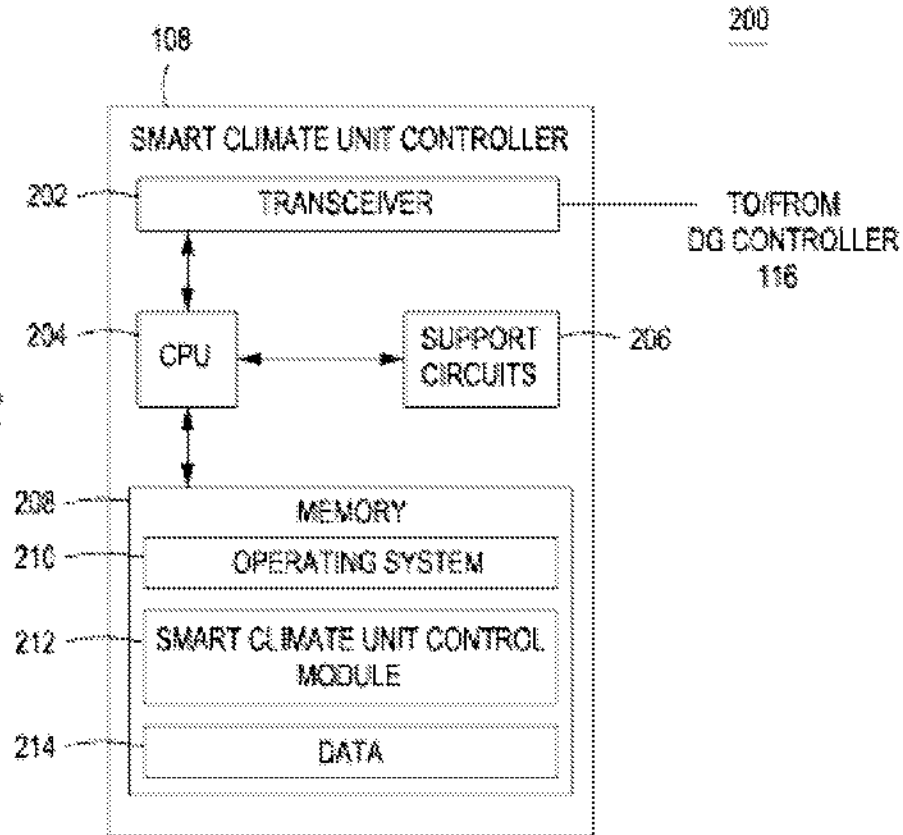
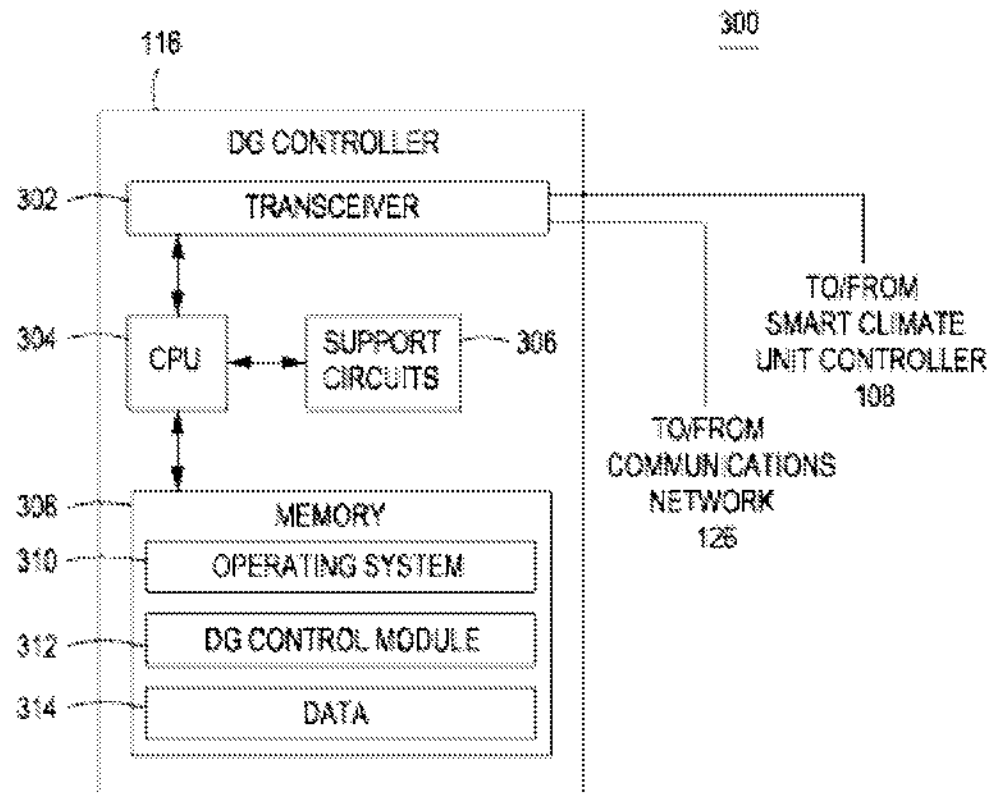


FIG. 3



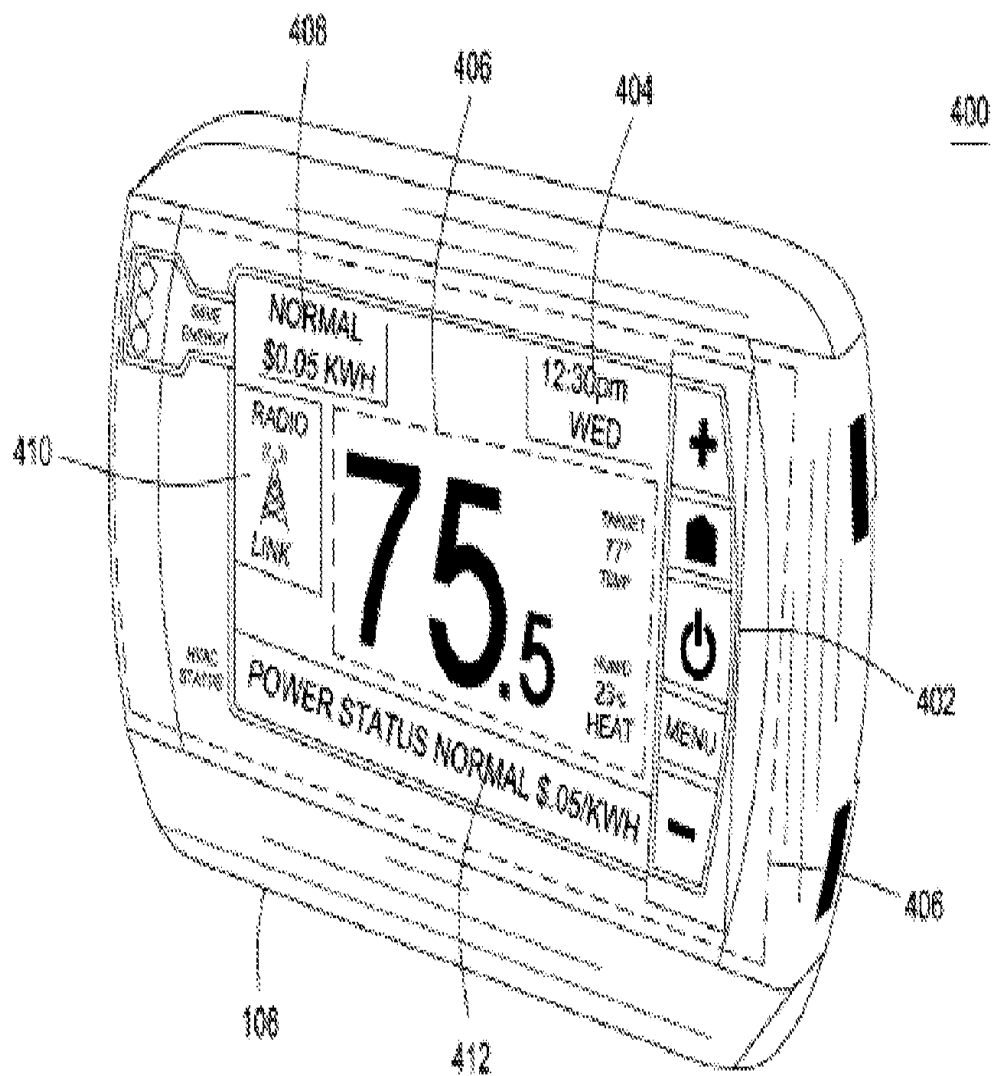


FIG. 4

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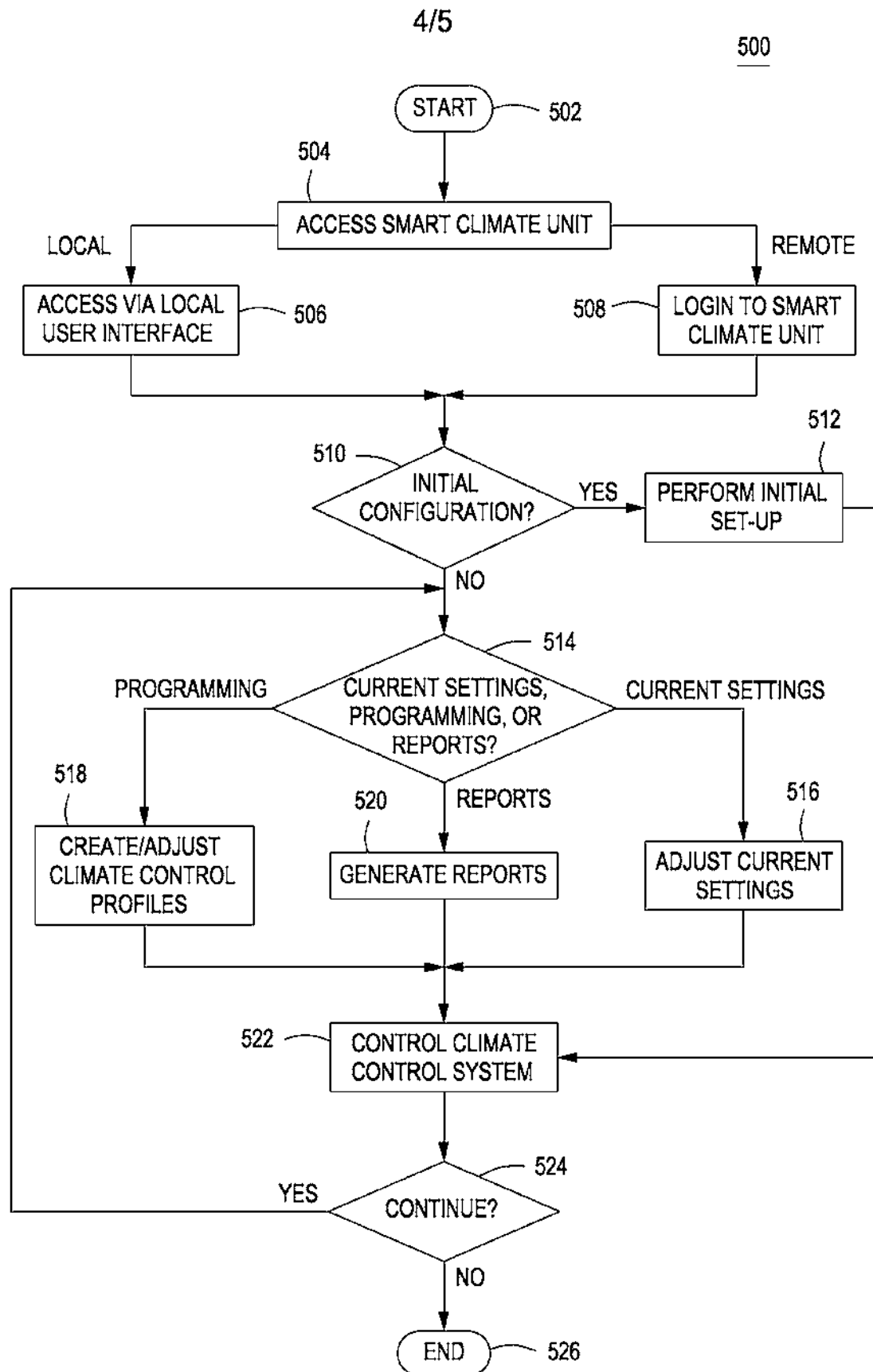


FIG. 5

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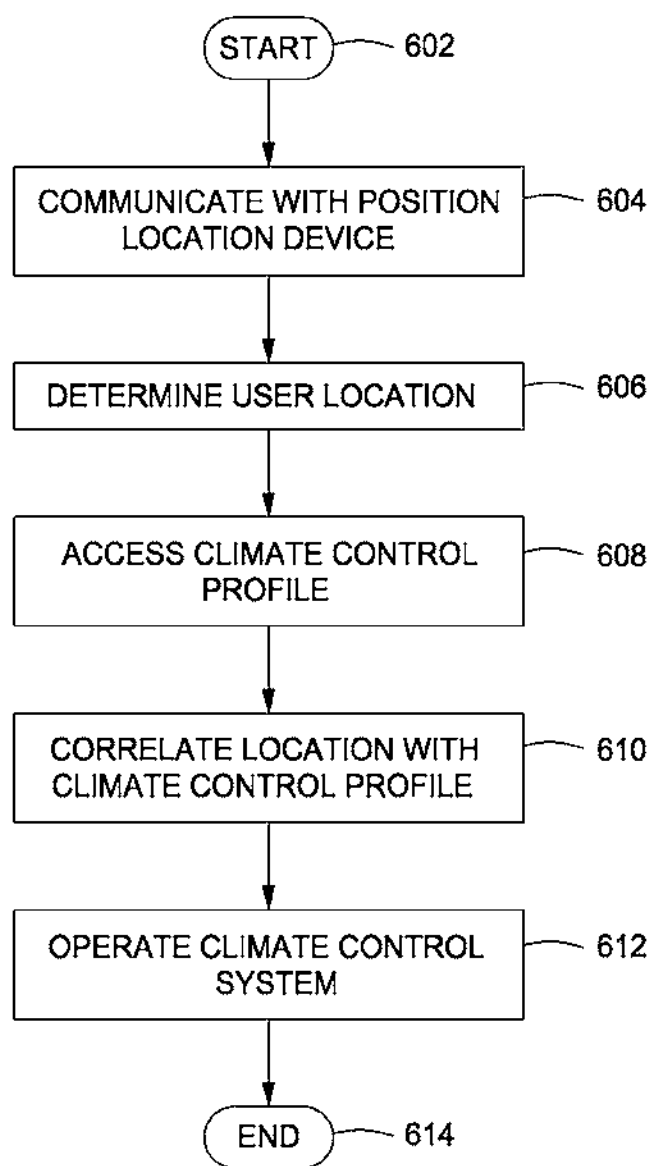
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FIG. 6

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(71) Applicant (for all designated States except US): ALLURE ENERGY, INC. (US/US), 2003 S. Lamar Boulevard, Suite 5, Austin, TX 78704 (US).

(72) Inventor: and

(73) Inventor/Applicant (for US only): IMES, Kevin, R. (US/US), 7309 Torrance Lane, Austin, TX 78739 (US);
HOLLISTER, James (US/US), 2804 Chaparral Drive, Round Rock, TX 78681 (US).

(74) Agents: ARIZ, John, S. et al.; Dickerson Wright PLLC, 78333 Woodland Avenue, Suite 2000, Bloomfield Hills, MI 48304-5092 (US).

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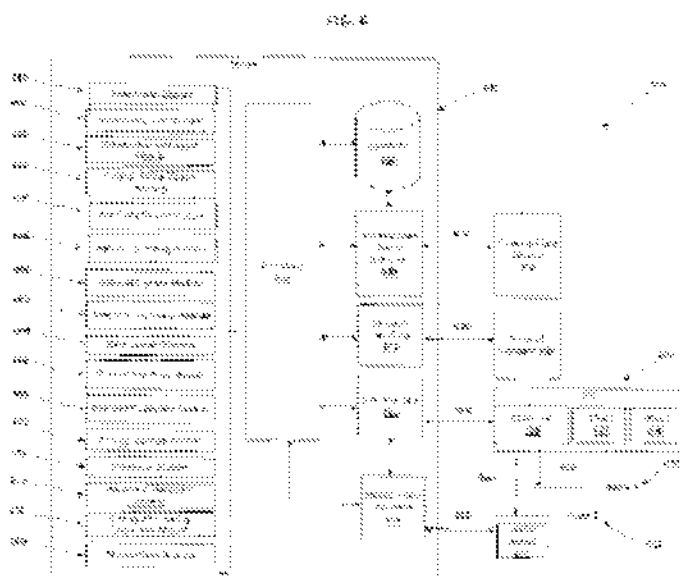
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(54) Title: ENERGY MANAGEMENT SYSTEM AND METHOD



(57) Abstract: A home energy management system includes a database configured to store site report data received from a plurality of residential sites using a wireless home energy network at each site. Each residential site includes a thermostat accessible to the wireless home energy network. A processor is operably coupled to the database and configured to access the site report data and detect a current temperature set-point of the thermostat of a first residential site, detect a first seasonal profile of the thermostat, detect a current operating mode of a HVAC system operably coupled to the thermostat, and determine a thermostat schedule of the thermostat using the first seasonal profile and the current operating mode of the HVAC system.

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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

ENERGY MANAGEMENT SYSTEM AND METHOD**CROSS REFERENCE TO RELATED APPLICATIONS**

[0001] The present application claims benefit of United States Provisional Patent Application Serial No. 61/255,678 entitled a "Proximity Based Home Energy Management System and Method", filed on October 28, 2009, and United States Provisional Patent Application Serial No. 61/235,798 entitled an "Alternative Energy Asset Management System with Intelligent Data Framework Capabilities, filed on August 21, 2009, and United States Provisional Patent Application Serial No. 61/226,899 entitled a "Congestion Detection, Curtailment, Storage, and Dispatch Module," filed on July 20, 2009, and United States Provisional Patent Application Serial No. 61/227,860 entitled a " Congestion Detection, Curtailment, Storage, and Dispatch Module," filed on July 23, 2009.

Field of the Disclosure

[0002] This disclosure relates generally to home systems, and more particularly to an energy management system and method.

BACKGROUND

[0003] Current energy management systems take a passive role to residential energy management. For example, consumers lack energy awareness and are typically left with having to evaluate a monthly bill to determine how much energy was consumed. Additionally, consumers lack transparency into what the leading causes of energy consumption are at their residences. Some utility companies are providing energy display only technologies that will allow consumers to see what the current price of energy may be. However, such displays take a passive role to conservation, and leaving it up to the consumer to manually curtail their use.

[0004] In certain regions, information infrastructure is lacking to enable utility companies and customers to access real-time energy consumption. For example, some regions have smart meters that are capable measuring and reporting consumption data. However, there is a lack of communication and analytical infrastructure to allow utility companies to analyze future demand and schedule energy production. For example, some utilities are providing demand response systems that react to load levels, and force curtailment on residential, industrial, and commercial customers. Such programs have not been well received as they typically inconvenience the end user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] It will be appreciated that for simplicity and clarity of illustration, elements illustrated in the Figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements are exaggerated relative to other elements. Embodiments incorporating teachings of the present disclosure are shown and described with respect to the drawings presented herein, in which:

[0006] FIG. 1 illustrates a block diagram of an energy management system and energy transmission system according to an aspect of the disclosure;

[0007] FIG. 2 illustrates a energy management system operable to manage energy at a site according to an aspect of the disclosure;

[0008] FIG. 3 illustrates a flow diagram of a method of managing energy at a site according to an aspect of the disclosure;

[0009] FIG. 4 illustrates a block diagram of a controller according to an aspect of the disclosure;

[0010] FIG. 5A illustrates a block diagram of a mobile device operable to be used with an energy management system according to another aspect of the disclosure;

[0011] FIG. 5B illustrates a block diagram of an energy management user interface according to another aspect of the disclosure;

[0012] FIG. 6 illustrates a block diagram of an energy management system according to another aspect of the disclosure;

[0013] FIG. 7 illustrates an energy management user interface according to an aspect of the disclosure;

[0014] FIG. 8 illustrates an energy management system interface operable to report energy usage and savings information according to a further aspect of the disclosure;

[0015] FIG. 9 illustrates an energy management system interface operable to access and edit user and site information according to a further aspect of the disclosure;

[0016] FIG. 10 illustrates an energy management scheduling user interface operable to schedule energy use at a residential site according to a further aspect of the disclosure;

[0017] FIG. 11 illustrates an wireless thermostat user interface operable according to an aspect of the disclosure;

[0018] FIG. 12 illustrates a block diagram of a wireless thermostat according to a further aspect of the disclosure;

[0019] FIG. 13 illustrates a block diagram of an energy network bridge according to a further aspect of the disclosure;

[0020] FIG. 14 illustrates a block diagram of a demand response system according to a further aspect of the disclosure;

[0021] FIG. 15 illustrates a block diagram of a aggregate demand schedule system according to a further aspect of the disclosure; and

[0022] FIG. 16 illustrates a flow diagram of a method of managing energy use at a residence according to a further aspect of the disclosure.

[0023] The use of the same reference symbols in different drawings indicates similar or identical items.

DETAILED DESCRIPTION OF DRAWINGS

[0024] The following description in combination with the Figures is provided to assist in understanding the teachings disclosed herein. The following discussion will focus on specific implementations and embodiments of the teachings. This focus is provided to assist in describing the teachings and should not be interpreted as a limitation on the scope or applicability of the teachings. However, other teachings can certainly be utilized in this application. The teachings can also be utilized in other applications and with several different types of architectures such as distributed computing architectures, client/server architectures, or middleware server architectures and associated components.

[0025] Devices or programs that are in communication with one another need not be in continuous communication with each other unless expressly specified otherwise. In addition, devices or programs that are in communication with one another may communicate directly or indirectly through one or more intermediaries.

[0026] Embodiments discussed below describe, in part, distributed computing solutions that manage all or part of a communicative interaction between network elements. In this context, a communicative interaction may be intending to send information, sending information, requesting information, receiving information, receiving a request for information, or any combination thereof. As such, a communicative interaction could be unidirectional, bidirectional, multi-directional, or any combination thereof. In some circumstances, a communicative interaction could be relatively complex and involve two or more network elements. For example, a communicative interaction may be "a

conversation" or series of related communications between a client and a server – each network element sending and receiving information to and from the other. The communicative interaction between the network elements is not necessarily limited to only one specific form. A network element may be a node, a piece of hardware, software, firmware, middleware, another component of a computing system, or any combination thereof.

[0027] For purposes of this disclosure, an energy management system, network device, or any combination thereof can include any instrumentality or aggregate of instrumentalities operable to compute, classify, process, transmit, receive, retrieve, originate, switch, store, display, manifest, detect, record, reproduce, handle, or utilize any form of information, intelligence, or data for business, scientific, control, entertainment, or other purposes. For example, an energy management system, network device, or any combination thereof can include any combination of a personal computer, a PDA, a consumer electronic device, a media device, a smart phone, a cellular or mobile phone, a smart utility meter, an advanced metering infrastructure, a smart energy device, an energy display device, a home automation controller, an energy hub, a smart energy gateway, a set-top box, a digital media subscriber system, a cable modem, a fiber optic enabled communications device, a media gateway, a home media management system, a network server or storage device, an energy substation, a vehicle charging station, a renewable energy production device, a renewable energy control device, an energy storage management system, a smart appliance, an HVAC system, a water pump, a heat pump, a hot water heater, a thermostat, an energy controller, an irrigation system, a lighting system, an alarm system, a smart power outlet, an energy detection device, a power measurement device, a power measurement unit (PMU), an air handler, a wireless air damper, a humidity control system, a heat and motion sensing device, a smart power outlet, a switch router, wireless router, or other network communication device, or any other suitable device or system, and can vary in size, shape, performance, functionality, and price.

[0028] According to an aspect, an energy management system can include memory, one or more processing resources or controllers such as a central processing unit (CPU) or hardware or software control logic. Additional components of the energy management system can include one or more storage devices, one or more wireless, wired or any combination thereof of communications ports to communicate with external devices as well as various input and output (I/O) devices, such as a keyboard, a mouse, pointers, controllers, and display devices. The energy management system can also include one or more buses operable to transmit communications between the various hardware components, and can communicate using wireline communication data buses, wireless network communication, or any combination thereof.

[0029] As used herein, a wireless energy network can include various types and variants of wireless communication configurable to manage energy at a site, including associated protocols or enhancements thereto including, but not limited to, any combination or portion of, IEEE 802.15-based wireless communication, Zigbee communication, INSITEON communication, X10 communication protocol, Z-Wave communication, Bluetooth communication, WIFI communication, IEEE 802.11-based communication, WiMAX communication, IEEE 802.16-based communication, various proprietary wireless communications, or any combination thereof.

[0030] As described herein, a flow charted technique, method, or algorithm may be described in a series of sequential actions. Unless expressly stated to the contrary, the sequence of the actions and the party performing the actions may be freely changed without departing from the scope of the teachings. Actions may be added, deleted, or altered in several ways. Similarly, the actions may be re-ordered or looped. Further, although processes, methods, algorithms or the like may be described in a sequential order, such processes, methods, algorithms, or any combination thereof may be operable to be performed in alternative orders. Further, some actions within a process, method, or algorithm may be performed simultaneously during at least a point in time (e.g., actions

performed in parallel), can also be performed in whole, in part, or any combination thereof.

[0031] As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, system, or apparatus that comprises a list of features is not necessarily limited only to those features but may include other features not expressly listed or inherent to such process, method, article, system, or apparatus. Further, unless expressly stated to the contrary, "or" refers to an inclusive-or and not to an exclusive-or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0032] Also, the use of "a" or "an" is employed to describe elements and components described herein. This is done merely for convenience and to give a general sense of the scope of the invention. This description should be read to include one or at least one and the singular also includes the plural, or vice versa, unless it is clear that it is meant otherwise. For example, when a single device is described herein, more than one device may be used in place of a single device. Similarly, where more than one device is described herein, a single device may be substituted for that one device.

[0033] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of embodiments of the present invention, suitable methods and materials are described below. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety, unless a particular passage is cited. In case of conflict, the present specification, including definitions, will control. In addition, the materials, methods, and examples are illustrative only and not intended to be limiting.

[0034] To the extent not described herein, many details regarding specific materials, processing acts, and circuits are conventional and may be found in textbooks and other sources within the computing, electronics, and software arts.

[0035] In accordance with an aspect of the disclosure, an energy management system is disclosed. The energy management system can include a database configured to store site report data received from a plurality of residential sites using a wireless home energy network at each site. According to an aspect, each residential site can include a thermostat accessible to the wireless home energy network. The energy management system can also include a processor operably coupled to the database and configured to access the site report data, detect a current temperature set-point of the thermostat at a first residential site, and detect a first seasonal profile of the thermostat. The processor can also detect a current operating mode of a HVAC system operably coupled to the thermostat, and determine a thermostat schedule of the thermostat using the first seasonal profile and the current operating mode of the HVAC system.

[0036] FIG. 1 illustrates a block diagram of an energy management system, illustrated generally at 100, according to an aspect of the disclosure. Energy management system 100 can include an energy source 102 configured to generate energy that can be coupled to an energy transmission system 104 to satisfy a load or demand at a first site 106, second site 108, third site 110, or any combination thereof. Energy transmission system 104 can be configured to be coupled to one or more of first site 106, second site 108, third site 110, or any combination thereof.

[0037] According to an aspect, first site 106 can include a distributed energy generation (DEG) asset 112. DEG asset 112 can include various types of energy producing assets such as a natural gas generator, fuel cell generator, solar array, solar concentrator, wind turbine generator, battery array, electric vehicle, hydro-power generator, any type of

generator, or any combination thereof capable of outputting energy to energy transmission system 104.

[0038] According to a further aspect, second site 108 can include a virtual capacity generation (VCG) asset 114. VCG 114 can include an energy consumption device configured to reduce energy consumption or load placed on energy transmission system 104 during various periods. For example, VCG asset 108 can include equipment located at a commercial facility, industrial facility and the like. According to another aspect, second site 102 can include a retail center having energy consuming devices that can be managed to reduce energy consumption. In other forms, second site 108 can include a residential site having VCG assets that include energy consuming devices such as an HVAC system, heat pump, hot water heater, lighting systems, entertainments systems, refrigerators, or any type of electricity consuming device or system, or any combination thereof. According to a further aspect, third site 110 can include a combination of assets such as DEG asset 116 and a VCG asset 118.

[0039] According to another aspect, first site 106 can be coupled to server 120 using an Internet or broadband connection 122. Second site 108 can be coupled to server 120 using a second Internet or broadband connection 124. Third site 110 can be coupled to server 120 using a third Internet or broadband connection 126. Various other types of connections can also be deployed by energy management system 100 as needed or desired.

[0040] According to another aspect, portions or combinations of energy transmission system 104 can be used within one or more markets such as ERCOT, Southwest Power Pool (SPP), California Independent system operator (CAISO), Western Electric Coordinating Council (WECC), other grids or markets, future national or regional grids, operators, councils, or any combination or portions thereof can be accessed using energy management system 100.

[0041] According to a further aspect, energy management system 100 can utilize energy management information (EMI) to manage energy production, consumption, curtailment, load shedding, purchase decisions, demand response decisions, or any combination thereof. For example, EMI can include any combination of data sources such as real-time congestion data, energy transmission line operating conditions, synchrophasor data, firm owned alternative energy generator operating status, non-firm owned alternative energy generator operating status, locational marginal pricing data, congestion revenue rights data, energy storage capacity, stored energy output capacity, real time energy pricing data, historical energy pricing data, real time nodal demand data, historical nodal demand data, real time zonal demand data, historical zonal demand data, external market demand data, historical external market demand data, nodal price data, real time energy price data, real time energy demand data, historical energy demand data, historical energy price data, firm owned alternative energy generator data, non-firm owned alternative energy generator data, est. firm owned alternative energy generator output schedule, estimated non-firm owned alternative energy generator output schedule, macro environmental data, micro environmental data, real-time grid congestion data, historical grid congestion data, renewable energy credit information, carbon credit cap and trade pricing information, fixed and variable costs for operating alternative energy generators, production tax credit (PTC) pricing information, investment tax credit (ITC) information, federal grant information, credit-to-grant comparison analysis data, PTC to ITC analysis data, interest / finance data for alternative energy generators, asset depreciation schedules, available solar and wind output capacity, distributed energy production scheduling data, feed-in tariff data, baseline energy generator data, load utilization data, transmission efficiency data, congestion right revenue data, priority dispatch data, federal renewable portfolio standard (RPS) data, state renewable portfolio standard (RPS) data, net-metering data, current or forecasted % coal production data, current or forecasted % natural gas production data, current or forecasted % green house gas production data, current or future coal pricing data, current or future natural gas pricing data, current or future oil pricing data, current or

future energy transmission pricing data, forecasted transmission price setting events, virtual capacity data, historical site performance data, seasonal weather and performance data, aggregate scheduling demand data, collaborative demand response data, historical device consumption data, forecasted device consumption data, or any combination thereof.

[0042] FIG. 2 illustrates an energy management system, illustrated generally at 200 and configured to be used at a site 202 according to an aspect of the disclosure. Site 202 can include a residential site, and industrial site, a manufacturing site, a commercial site, or any combination thereof. According to an aspect, energy management system 200 can include a server 204 located at a remote location that can be communicatively coupled to a network 206. According to a further aspect, site 202 can include a controller 216 capable of connecting to a wireless thermostat (TSTAT) 208, an associated mobile device 210, one or more smart appliances 212, a distributed energy generating asset 214, or any combination thereof. In a form, controller 216 can establish a wireless energy network 242 using a wireless communication described herein. Various combinations of networks and variants thereof can also be deployed by controller 216 to establish wireless energy network 242.

[0043] According to a further aspect, mobile device 210 can communicate with controller 216 using a WIFI or 802.11 based communication, Bluetooth communication, Zigbee communication, or various other wireless communication, or any combination thereof. According to a further aspect, mobile device 210 can communicate with an information network 240 using a subscriber based wireless data communication network such as a 3G network, 4G network, EDGE network, a cellular network, WiMAX, other wireless data communication, or any combination thereof. According to a further aspect, site 202 can include a gateway 218 configured as a broadband gateway such as a DSL gateway, cable system gateway, fiber optic gateway, or any combination thereof.

[0044] According to another aspect, energy management system 200 can include an advanced metering infrastructure (AMI) gateway 242 configured to communicate with a

smart metering device 250. Smart metering device 250 can include a utility or power company owned metering device and can be configured to communicate using a wireless network such as a cellular network, a mesh network, WiMAX network, or any combination thereof. According to an aspect, controller 216 can communicate with AMI gateway 242 using an AMI network 248 communicated by AMI gateway 242.

[0045] According to a further aspect, energy management system 200 can include server 204 configurable to include various energy management logic, modules, interfaces, database sources, or various combinations thereof to manage energy use at site 200. Server 204 can also include a processor 222 that can be configured as multiple processors having one or more processing cores as needed or desired, one or more databases 224 that can be internal or external to server 204, and memory 226 configurable to store data. According to an aspect, server 204 can be located in a single location however multiple locations, and server configurations including cloud computing, distributed computing, dedicated computing, or any combination thereof can be deployed. According to an aspect, controller 216 can include portions or all of server 204 and can deploy some or all of the capabilities of server 204.

[0046] According to another aspect, server 204 can include a site interface 220 operable to be coupled to network 206 and gateway 218 to communicate data between site 202 and server 204. Server 204 can also include a mobile client interface 226 that can be coupled to a wireless telecommunications communication gateway such as a WAP gateway and the like. According to an aspect, mobile client interface 226 can communicate with one or more mobile devices 210, using information network 240 or another data network provided by a wireless telecommunications provider. Mobile client interface 226, mobile device 210, an information network 240, or various combinations thereof can include secure connection capabilities such as SSL connections or other carrier supported secure connection capabilities. Server 204 can also include an energy price monitor 228, a demand response module 230, an efficiency rating module 232, a proximity detection

module 234, a scheduling module 236, an energy savings module 238, a messaging module 240, or any combination thereof.

[0047] According to an aspect, energy price monitor 228 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to monitor energy pricing of site 202.

[0048] According to an aspect, demand response module 230 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to manage demand response preferences and capabilities of site 202.

[0049] According to an aspect, efficiency rating module 232 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to determine an efficiency rating, thermal response, virtual capacity capabilities, performance data, or various other of site 202.

[0050] According to an aspect, proximity detection module 234 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to detect a location of mobile device 210 relative to site 202, and modify operating conditions of site 202 based on a proximity of mobile device 210 to site 202.

[0051] According to an aspect, scheduling module 236 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to schedule energy use or operations of one or more energy consuming devices at site 202.

[0052] According to an aspect, energy savings module 238 can be deployed by processor 222 and can access EMI stored within database 224 or a remote data source to determine a past or forecasted energy savings of site 202. In a form, server 204 can include user account login information at a utility company or energy provider that can enable a user to gain access to meter data. As such, energy savings module 238 can pull EMI data stored at a third party website, and output past or forecasted energy savings of site 202.

[0053] According to an aspect, messaging module 240 can be deployed by processor 222 and can access LMI stored within database 224 or a remote data source to communicate messages. For example, messaging module 240 can use an email address, mobile device identifier, SMS gateway data, network device identifier data, IP address of controller 216, IP address of gateway 218, IP address of AMI gateway 242, or any combination thereof to communicate messages or other energy management information.

[0054] According to a further aspect, energy management system 200 and controller 216 can access consumption data at site 202 using AMI gateway 242. For example, controller 216 can include a wireless communication module (not expressly illustrated in FIG. 2) such as a Zigbee communication module (e.g. 802.15.4), WIFI module, Bluetooth module or various other wireless modules, or any combination thereof. Controller 216 can include one or more profiles stored within a memory device (not expressly illustrated in FIG. 2) configured to include data that will enable controller 216 to join AMI gateway 242. For example, a profile can include various attributes to initiate or establish communication using one or more security levels as needed or desired.

[0055] According to a further aspect, energy management system 200 can be used with an energy management application accessible or deployed by mobile device 210 or other computing device. For example, the energy management application can be used to control TSTAT 208, one or more smart appliances 212 or various other devices at site 202. A user can access the energy management application using mobile device 210 or other computing device and read the current settings, operating conditions, or various other types of energy management information associated with site 202. For example, a user can view if TSTAT 208 and an associated HVAC system (not expressly illustrated in FIG. 2) is on or off, a mode such as heat, A/C, or fan, or any combination thereof. In other forms, the user can use the energy management application to access multiple thermostats or zones at site 202. Although the energy management application has been described in the context of accessing TSTAT 208, it should be understood that other network devices,

smart appliances, lighting systems, or any other energy consuming or network accessible device or any combination thereof can be accessed using the energy management application.

[0056] According to a further aspect, mobile device 210 can include a mobile device application that can upload location data to server 204, controller 216, TSTAT 210, smart appliances 212, various other devices capable of receiving location data, or any combination thereof. For example, in a particular form mobile device 210 can report a current location using a location application program interface (API) of mobile device 210, and can upload location data to server 204 using mobile client interface 226. Server 204 can then deploy proximity detection module 234 to determine whether one or more operating conditions should be altered at site 202. For example, proximity detection module 234 can include rules based logic to determine if an operating condition of a resource at site 202 should be altered. For example, if a user is greater than two miles away from site 202, and is moving away from site 202, server 204 can generate a control action report to be communicated to site 202. For example, a control action report can include adjusting TSTAT 208 up a specific number of degrees relative based on the distance and direction a user may be from site 202.

[0057] According to a particular aspect, a user may have previously established an upper setting limit a user would like an internal temperature to reach at site 202 without having an associated HVAC unit turning on. The upper setting limit can be sent to TSTAT 208 based on how far a user may be from site 202. A lower limit can be established for a heating unit as well. These limits can be entered using mobile device 210, a web-based user interface, or any combination thereof.

[0058] According to another aspect, server 204 can characterize site 202 to determine operating characteristics and performance data of site 202 and associated energy consuming devices at site 202. For example, server 204 can use efficiency rating module 232 to monitor performance data at site 202. Performance data can include measured

performance data detected by controller 216, performance specifications of an energy consuming device that can be based on a model number or other identification data of the device, the size or square footage of site 202, efficiency improvements or specifications of site 202, various other FMI data, or any combination thereof. As performance of an energy consuming device may be detected, an energy alert can be sent using messaging module 240. In another form, an energy alert can be sent to a third party to initiate a service call at site 202. For example, one or more third parties may subscribe to a service to buy leads based on an energy consuming devices performance eroding. Server 204 can include a lead generation module (not expressly illustrated in FIG. 2) that can be communicated using messaging module 240 to a subscriber such as a service company, appliance provider, and the like.

[0059] In another form, performance data can be used to determine when to adjust an operating condition of an energy consuming device based on a schedule, proximal location of the user and mobile device, in response to a demand response event, in response to a consumer setting of a desired operating condition based on an energy savings mode (e.g. low, med, high), or any combination thereof.

[0060] According to a particular aspect, controller 216 can be configured as a plug-device that can be plugged directly to a wall socket or other power receptacle and can include various components (not expressly shown in FIG. 2). Controller 216 can also include a network interface or Ethernet port, one or more USB interfaces or mini-USB interfaces, an SDIO slot, additional data or plug interfaces, or any combination thereof. Controller 216 can include an internal or external AC, DC, AC to DC converter power module, or any combination thereof to power controller 216. According to an aspect, controller 216 can be provided as a small form factor unit to allow for easy installation, use, and discretionary placement. For example, controller 216 can include a plug computer based on Marvell Corporation's Kirkwood ® microprocessor, Part Number 6281 and associated components. In another form, controller 216 can include a plug computer including

specifications described in “Sheeva Plug Development Kit Reference Design”, version 1.1, and previous versions which are herein incorporated by reference. Other processors having various other speeds and supporting components can also be used. According to an aspect, controller 216 can include various buses that can be used to install one or more wireless modules. For example, controller 216 can include a UART bus interface that can be used to interface a Zigbee module, WIFI module, Bluetooth Module, various other modules or combinations thereof. Various other buses can also be used including but not limited to a USB bus, a SPI bus, an SDIO bus, a mini-USB bus, or any combination thereof. Controller 216 can include buses that can be located internal or external to a housing of controller 216.

[0061] According to an aspect, energy management system 200 can include one or more network devices, such as TSTAT 208, smart appliances 212, or various other network devices installed at a residential site such as a home or residence. Controller 216 can establish a wireless energy network 242 capable of communicating with a network device at site 202. Energy management system 200 can also include server 204 disposed remotely from site 202 and capable of generating a control action report to control the network device. Controller 216 can also be located at site 202 including a residential site. Controller 202 can be in communication with server 204. According to an aspect, controller 202 can establish initiate a plurality of operating status requests of the network device, and receive device data in response to at least one of the operating status requests. Controller 202 can further generate a site report including the device data, and initiate a communication of the site report to server 204. During the communication of the site report from controller 202 to server 204, controller 202 can detect an availability of a control action report at server 202 in conjunction with the communication of the site report. As such, a secure connection can be initiated from site 202 to communicate site reports and receive control action reports without having to have server 204 initiate a communication with site 202.

[0062] According to another aspect, server 202 can generate control action report prior to a site report upload, in association with a site report upload, or any combinations thereof. For example, one or more control action reports can be generated and queued in advance of a site report upload. In other forms, a control action report can be generated during a site report upload. In yet another form, a control action report can be generated in response to information uploaded within the site report. As such, various combinations of control action report generation techniques can be deployed as needed or desired.

[0063] According to an aspect, energy management system 200 can be used to generate a control action report in response to a distance mobile client 210 may be from site 202. For example, site 202 can include a network device, such as TSTAT 208, joined to wireless energy network 242. According to an aspect, controller 216 can be configured to establish wireless energy network 242 using a wireless mesh network and initiate a plurality of operating status requests. For example, controller 216 can access TSTAT 208 using wireless energy network 242 at a first operating status request interval. Controller 216 can be used to generate a site report that can include device data of TSTAT 208 at a site report interval. According to an aspect, a site report interval can be the same interval as the first operating status request interval. In other forms, each interval can be different. For example, the first operating status report request interval can be set to thirty seconds and the site report interval can be set to sixty seconds. As such, two cycles of data can be acquired. Various combinations of intervals can be used as desired.

[0064] According to a further aspect, controller 216 can initiate a communication of site report to a remote server such as server 204 using gateway 218. For example, gateway 218 can include a residential broadband connection 206 capable of establishing a secure gateway connection between site 202 and server 204 using a public communication network. According to an aspect, residential broadband connection 206 does not include a cellular communications based network.

[0065] In another form, control data can be provided in response to a detection of a travel direction and a distance between mobile device 210 having location reporting device, and site 202. For example, as a user of mobile device 210 is moving away from site 202, server 204 can detect a direction and distance mobile device 210 may be from residential site 202. Server 204 can then determine if a control action should be generated. For example, as mobile device 210 moves away from residential site 202, TSTAT 208 setting can be adjusted up during a warm or summer season (or down during a cold or winter season) to reduce energy consumption. Other network devices can also be adjusted as needed or desired.

[0066] According to a further aspect, energy management system 200 can use energy pricing monitor 228 to generate a control action report. For example, energy pricing monitor 228 can be configured to detect energy pricing within an energy market, and initiate curtailing use of a network device, such as TSTAT 208, smart appliance 212, other network devices at site 202, or any combination thereof. For example, energy pricing monitor 228 can output a control action report in response to an unfavorable pricing condition, and further upon the detection of a travel direction and a distance between mobile device 210 and site 202. In another form, energy pricing monitor 228 can also initiate use of one or more network devices at site 202 in response to a favorable pricing condition, and a detection of a travel direction and a distance between mobile device 210 and residential site 202. In this manner, a user's travel direction, distance, and current energy pricing within a market can be used to determine how energy consumption can occur at site 202.

[0067] According to a further aspect, energy management system 200 can also use demand response module 230 to detect a demand response condition and respond accordingly. For example, demand response module 230 can be used to detect a grid condition favorable to a demand response event and detect a profile preference setting of an user or site manager of site 202. For example, a user or site manager can set a profile

to always participate, not participate, or have a request sent to collaborate on whether to participate. Other profile settings can also be used such as determining an economic or monetary value to a user or site manager if participating in a demand response event. For example, a favorable grid condition can include an increase in the price of energy due to an undersupply of energy within an energy transmission system or market (not expressly illustrated in FIG. 2). In another form, a favorable condition can include an oversupply of energy purchased by an energy provider of site 202. Additionally, a high demand period can be detected and the oversupply of energy can be increased using a demand response event. In another form, a favorable grid condition can include a time interval when transmission pricing to use an energy transmission system may be determined. As such, an energy provider would receive an economic benefit from reducing load when the transmission rate or rate for using transmission lines would be determined. Various combinations of favorable grid conditions can be detected as needed or desired in association with determining a demand response event to curtail energy use at site 202.

[0068] According to an aspect, energy management system 200 can use demand response module 230 configured to detect an energy capacity of site 202 having a residence. For example, demand response module 230 can detect a grid condition favorable to a demand response event, and can also detect a preference of an resident or owner of the residence to participate in demand response events. Demand response module 230 can also determine an energy capacity of site 202 using historical device consumption data received in a site report, and forecasted device consumption data. Control data can then be generated to alter an operating condition of the network device in response to the grid condition and the preference of the owner and the energy capacity of site 202.

[0069] According to a further aspect, server 204 can determine an energy capacity of site 202 using device data received in association with site reports received from site 202. For example, site report data can be used with efficiency rating module 232 to determine a virtual generation capacity or energy reduction capacity of site 202. Upon detecting an

available capacity, demand response module 230 can output a curtailment action to be used within a control action report to be communicated to site 202. For example, a curtailment action can include an updated control data to alter a current operating condition of one or more network devices connected to wireless energy network 242 at site 202.

[0070] According to a further aspect, controller 216 can be configured to detect a new set-point value within a control action report, and identify TSTAT 208 to be adjusted to the new set-point value. In some forms, multiple wireless thermostats can be accessed via wireless energy network 242 and adjusted as desired. Controller 216 can communicate a different set-point values to each of the wireless thermostats. Controller 216 can initiate an outputting of new set-point values to TSTAT 208 and others using wireless energy network 242.

[0071] According to an aspect, energy management system 200 can use proximity detection module 234 to detect a distance mobile device 210 may be from site 202 including a residential site. For example, proximity detection module 234 can access location data stored within database 224 and provided by mobile device 210 using mobile client interface 226. Proximity detection module 234 can further detect mobile device 210 within a first zone (e.g. less than one (1) mile from the site, less than three (3) miles from site, greater than five (5) miles from site, etc.). Proximity detection module can further detect a current thermostat setting of TSTAT 208, and an indoor temperature detected at site 202 and communicated within a site data report communicated from site 202. Proximity detection module 234 can then determine a percentage adjustment to adjust a current setting of TSTAT 208, and output the percentage adjustment as a new set-point value to be used within a control action report. For example, if mobile device 210 can be detect as being greater than three (3) miles from site 202, TSTAT 208 can be adjusted to within 75% of the maximum setting in a summer season, or minimum setting in a winter season. As such, a site 202 can be managed based on a user's proximity to a site, which

zone a user may be located in, and current seasonal schedule or setting being used at a site 202.

[0072] According to another aspect, energy management system 200 can include TSTAT 208 configured as a wireless thermostat capable of joining wireless energy network 242 operable as a wireless home energy network. According to an aspect, TSTAT 208 can be configured to not include an enabled local programming schedule configured to control an HVAC system of site 202. For example, TSTAT 208 can include sufficient memory to store a set-point value, but may be not include scheduling capabilities at TSTAT 208. As such, a simplified user interface of TSTAT 208 can be deployed. For example, if TSTAT 208 includes a scheduling feature, energy management system 200 can be used to disable the scheduling feature located at TSTAT 208. As such, TSTAT 208 can be considered a non-programmable thermostat capable of connecting to wireless energy network 242, and set-point values or other control actions can be received using wireless energy network 242. In this manner, scheduling use of TSTAT 208 can be provided using on-line or web application based scheduling tool.

[0073] According to a further aspect, controller 216 can be further configured to initiate joining TSTAT 208 to wireless energy network 242 using a unique identifier of TSTAT 208. A unique identifier of TSTAT 208 can be received from server 204 and a local schedule and or scheduling capabilities of TSTAT 208 can be disabled. In this manner, an overall design complexity of a thermostat can be reduced and scheduling capabilities can be provided using a schedule created within a network environment and output by controller 216, server 204, mobile device 210, or any combination of sources capable of providing schedule information or control action data to TSTAT 208.

[0074] According to another aspect, energy management system 200 can also use scheduling module 236 to schedule use of a network device located at site 202 and capable of connecting to wireless energy network 242. Additionally, multiple user schedules can be stored within database 224 and used by site 202. For example, scheduling module 236

can be used to detect a first user schedule accessible to controller 216. The first user schedule can include a first schedule event configured to alter an operating condition of a network device such as TSTAT 208, smart appliance 212, or other energy consuming network devices. According to an aspect, the first user schedule can be operably linked to mobile device 210 having a location detection device. The first user schedule can be used or not used based on a distance mobile device 210 may be from residence 202. In this manner, as user returns to residential site 202, a user schedule can be activated and used.

[0075] According to another aspect, energy management system 200 can include a second user schedule accessible to controller 216. For example, a second user schedule can include scheduling data to schedule a second schedule event configured to alter an operating condition of a network device at site 202. The second user schedule can be operably linked to a second mobile device having a location reporting device (not expressly illustrated in FIG. 2). For example, the second user schedule can be used or not used based on a distance a second mobile device may be from site 202. In another form, mobile device 210 may not be located at site 202, but a second mobile device may located be at site 202. In this form, a second user schedule may be based on detecting the second mobile device located at site 202. According to an aspect, the second user schedule can be disabled when the second user leaves the site 202 and a proximity mode can be enabled. According to a further aspect, a second user schedule may not be operably linked to any mobile device. As such, controller 216 can use a second user's schedule to schedule events in response to a detection of mobile device 210 being a distance away from residential site 202. In this manner, multiple user schedules and proximity control of energy use can be deployed at a common site.

[0076] According to an aspect, energy management system 200 can also include controller 242 capable of detecting advanced metering infrastructure (AMI) wireless network 248 output by smart metering device 250. For example, smart metering device 250 can include, or can be coupled to, AMI / Gateway 242 capable of outputting AMI wireless

network 248. In other forms, smart metering device 250 can be configured to output AMI wireless network 248 directly.

[0077] According to another aspect, controller 216 can be configured with a communication interface (not expressly illustrated in FIG. 2) to enable joining AMI wireless network 248. In this manner, controller 216 can gain access to AMI wireless network 248 to receive AMI data. In a further aspect, controller 216 can use the AMI data to alter an operating condition of a network device at site 202, output AMI data using a display of a network device, communicate AMI data to server 204, or any combination thereof. According to a further aspect, controller 216 can communicate the AMI data with site report data as a site report to server 204. As such, AMI data and site report data can be used at server 204.

[0078] According to a further aspect, controller 216 can connect to AMI wireless network 248 at a first security level, and alter an operating condition of a network device connected to wireless energy network 242 at a second security level. According to an aspect, wireless energy network 242 can be deployed at the same security level as AMI wireless network 248, can be deployed at a different security level than AMI wireless network 248, or any combination thereof.

[0079] According to a further aspect, a user or site profile can be used to enable use of control actions initiated or received by AMI wireless network 248. For example, a site manager or user can establish a profile setting to enable or disable a utility company to alter an operating condition of a network device at a residence. As such, controller 216 can access a profile setting prior to connecting to AMI wireless network 248, enabling use of a control action received using the AMI wireless network 248, or any combination thereof. In other forms, controller 216 can access server 204 to detect profile settings.

[0080] According to another aspect, energy management system 200 can also include controller 216 configured to communicate using a Zigbee network and a WiFi network.

For example, controller 216 can include a ZigBee enabled communication device (not expressly illustrated in FIG. 2) capable of initiating wireless energy network 242 at site 202 that includes a residential site. Controller 242 can also include a WIFI enabled communication device (not expressly illustrated in FIG. 2) capable of initiating WIFI network 244 operable to be coupled to mobile device 210 that may be WIFI enabled, or other WIFI enabled devices, systems, or any combination thereof.

[0081] According to a further aspect, controller 216 using WIFI network 244 can be used to alter an operating condition at site 202 in response to detecting mobile device establishing or losing a WIFI connection to WIFI network 244. For example, a user schedule can be enabled when a WIFI connection of mobile device 210 can be detected, and an operating condition of one or more network devices connected to wireless energy network 242. As mobile device 210 leaves site 202, an operating condition of one or more network devices can be altered upon a detection of a WIFI connection of mobile device 210 to WIFI network 244 being lost.

[0082] According to an aspect, mobile device 210 can communicate with controller 216 to access site data, site reports, control action data, AMI data, or various other types of EMI data available using WIFI network 244. According to an aspect, mobile device 210 can initiate control actions, control action reports, or combinations thereof that can alter an operating condition of a network device coupled to wireless energy network 242. According to a further aspect,

[0083] According to another aspect, controller 216 configured with a WIFI communication device can enable a connection to a home computer system, laptop computer, Netbook, home server, IPAD®, home automation system, router, or other WIFI enabled system or devices (not expressly illustrated in FIG. 2), or any combination thereof. For example, a user can use an IPAD to access controller 216. Using WIFI network 244 and wireless energy network 242, a user can receive operating status information, initiate control actions of network devices, schedule energy use, or various

other energy management activities. In some forms, controller 216 may not have access to network 206. Controller 216 can include portions or all of the capabilities of server 204 to schedule energy use, generate scheduling data, access site data, generate control action data, or any combination thereof. As such, in some instances network 206 may not be established (e.g. in a new construction site, etc.), or if a network failure or an absence of network availability occurs, a user can access network devices at site 202 and manage energy use.

[0084] According to another aspect, controller 216 can detect when mobile device 210 connects to WiFi network 244 and alter an operating condition of a network device coupled to wireless energy network 242. For example, as mobile device 210 moves or transitions away from site 202, controller 216 can detect a signal loss and alter an operating condition at site 202. According to an aspect, controller 216 can include control action data to be used upon detecting a signal loss. In other forms, controller 216 can report the signal loss to server 204 within, or external to a site report. Server 204 can then determine a control action (if any) in response to a reporting of the WiFi signal being lost.

[0085] According to a further aspect, server 204 can initiate a text message using messaging module 240 to be sent to mobile device 210. User of mobile device 210 can then view the text message and respond to alter an operating condition at site 202. For example, a user can place site 202 in proximity mode which will enable an energy efficiency schedule associated with the user. In other forms, a user can access an energy management application accessible to mobile device 210 and alter an operating condition at site 202. Various combinations of messaging communications (e.g. SMS text, email, social network messaging, social network postings, etc.), message content, and various combinations thereof can be used to inform a user of mobile device 210 that an operating condition can be altered in response to mobile device 210 not being connected to a WiFi signal at site 202, a detection of mobile device 210 being a distance from site 202 using location detection, or any combination thereof.

[0086] According to another aspect, controller 216 can also connect to mobile device 210 using WIFI network 244 and communicate information using mobile device 210 and information network 240. For example, mobile device 210 can connect to information network 240 which can be a wireless subscriber based information network. Mobile device 210 can receive energy management information from an information source accessible to information network 240. According to an aspect, mobile device 210 can include a mobile energy management application that can be used to access server 204 or other information source(s). Mobile device 210 can be used to upload information such as a site report, network device data, operating statuses, or various other types of information that can be obtained at site 202 using wireless energy network 242. According to a further aspect, mobile device 210 can receive information such as control action reports, control data, environmental data, scheduling data, user profile data, network device profile data, Zigbee based profile data, WIFI data, configuration data, network device data updates or firmware updates, controller data updates or firmware updates, or various other types of EMI data or any combination thereof that can be communicated to mobile device 210 using information network 240. Mobile device 210 can then communicate received information to controller 216 using WIFI network 244. Controller 216 can use the received information to manage energy use at site 202.

[0087] According to a further aspect, controller 216 can be configured to request profile data, profile updates, network device updates, or any combination thereof of a network device using WIFI network 244, wireless AMI network 248, network 206, or any combination thereof. For example, controller 216 can detect a Zigbee enabled network device at site 202. Controller 216 can identify unique identifier of the Zigbee enabled network device, and request a profile of the Zigbee enabled network using WIFI network 244. For example, mobile device 210 can request a Zigbee profile using information network 240. In another form, a home computer, laptop computer, IPAD® etc. can request the Zigbee profile using network 206. In another form, controller 216 can access

wireless AMI network 248 to request a Zigbee profile. As such, controller 216 can be configured to request profile data, profile updates, network device updates, various other types of information to manage network device, or any combination thereof of a network device using one or more networks accessible to controller 216.

[0088] According to a further aspect, controller 216 can be incorporated into a network device. For example, controller 216 and TSTAT 208 can be combined into the same unit. Controller 216 can also include an 802.15.4 based wireless communication device (not expressly shown in FIG. 2) operable to establish wireless energy network 242. Controller 216 can also include an 802.11 based wireless communication device (not expressly shown in FIG. 2) operable to communicate with mobile device 210. Using the 802.11 based wireless communication device, controller 216 can communicate with gateway 218 having a residential broadband wireless router capable of establishing an 802.11 based wireless communication network at site 202. In this manner, combining controller 216 and TSTAT 208 can lead to a reduction in the number of separate devices deployed at site 202.

[0089] According to a further aspect, controller 216 can include a processor (not expressly illustrated in FIG. 2) configured to deploy a web server capable of enabling web services. For example, controller 216 can connect to WIFI network 244 and a computer system at site 202. The computer system can include a browser configured to access an IP address of the web server of controller 216 to manage one or more network devices coupled to wireless energy network 242. In a particular form, controller 216 can include a scheduling tool configured to be output by the web server and accessible using WIFI network 244. According to a further aspect, controller 216 can be coupled to mobile device 210 and controller 216 can be configured to enable access to a subscriber based wireless information network 240 using a connection to the 802.11 based wireless communication device of controller 216.

[0090] FIG. 3 illustrates a method of managing energy at a site according to an aspect of the disclosure. Portions or all of the method of FIG. 3 can be used with portions or all of the energy management systems, devices, or apparatuses disclosed herein, or any other type of system, controller, device, module, processor, or any combination thereof, operable to employ all, or portions of, the method of FIG. 3. Additionally, the method can be embodied in various types of encoded logic including software, firmware, hardware, or other forms of digital storage mediums, computer readable mediums, or logic, or any combination thereof, operable to provide all, or portions, of the method of FIG. 3.

[0091] The method begins generally at block 300. At decision block 302, the method detects whether an energy network has been established. For example, a wireless energy network can be established and can include one or more networks that can be used to manage energy use at a site. According to an aspect, a wireless energy network can be established using a wireless enabled controller located at a residence. At decision block 302, a detection of an energy network, AMI enabled network, WIFI enabled network, Zigbee enabled network, WiMAX network, or any other type of energy network, or any combination thereof can be detected. If at decision block 302, one or more networks may not be detected, the method can proceed to decision block 304. At decision block 304, the method can detect if there is an AMI network available. If at decision block 304 there is an AMI network available, the network can proceed to block 306 and the AMI network can be joined. For example, the AMI network can include a specific protocol and security level to establish communication or allow a joining of the network. For example, the AMI network may require an encryption key-based security that can require specific keys, certificates, etc. to enable access. According to another aspect, the AMI network may include a smart grid based security described in Smart Grid standards. As such, various combinations of joining the AMI network can be deployed. Upon joining the AMI network, the method can proceed to decision block 308.

[0092] In some forms, an AMI network may be available and the method can be modified to determine whether to join the AMI network. If at decision block 304, an AMI network may not be detected (or may not be joined), the method can proceed to decision block 308. At decision block 308, the method can detect if a WIFI network (e.g. 802.11 based network) may be available. If a WIFI network is not detected or is not available, the method can proceed to block 310 and a WIFI network can be established. For example, a controller, network device, smart appliance, or various other types of energy consuming devices can include a WIFI communication device capable of initiating a WIFI network. As such, at block 310 a WIFI network can be established and the method can proceed to block 312. If at decision block 308 a WIFI network exists, or if a WIFI network should not be established, the method can proceed to block 312. In some forms, an additional WIFI network can be established at block 310 and the method can be modified to allow a bridging between the two WIFI networks.

[0093] According to an aspect, at block 312 an energy network can be established to manage one or more network devices. For example, an energy network can include a wireless energy network that is based on a Smart Grid standards and protocols such as a Zigbee based protocol. Various other types of communication can also be used to establish an energy network. An energy network can be established by outputting a wireless network at a site to enable a network device to join the energy network.

[0094] Upon establishing an energy network, the method can proceed to block 314 a network device capable of connecting to the energy network can be detected. For example, a network device can include a Zigbee enabled communication device capable of joining a Zigbee enabled energy network. A unique identifier of the network device can be detected and a profile can be obtained at block 316. In some forms, a unique identifier can be previously obtained by a controller deploying the energy network. For example, a unique identifier can be obtained from a server accessible to a controller, via a WIFI or other network accessible to a controller, or any combination thereof. In other forms, an

external information source can be capable of providing a unique identifier, or a list of unique identifiers to identify a valid network device that can be joined to the energy network. A controller can then use the unique identifier, and the profile, to establish or join the network device to the energy network.

[0095] In another form, a profile of a network device may not be immediately available, or may have been revised. As such, a profile can be obtained using a WIFI network, an AMI network, an Internet or broadband network, or any combination thereof. For example, a unique identifier, a model number, a serial number, a device class identifier, or any combination thereof that can be communicated to an external source or information network to obtain a profile can be used. A profile can then be identified and used to join the network device to the energy network.

[0096] According to a further aspect, obtaining a profile at block 316 can include initiating a request using a controller and an information network accessible to a mobile device capable of communicating with a WIFI network at a site. For example, a profile can be provided by connecting a mobile device to a wireless information network such as a 3G data network, 4G data network, or other subscriber based wireless information network. The mobile device can then communicate the profile to the controller using the WIFI network at the site. The controller can then receive the profile and use at least a portion of the profile within the energy network.

[0097] According to an aspect, upon obtaining a profile, the method can proceed to block 318 and the network device can be joined to the energy network. For example, the network device can be joined at a security level that is different than required by an AMI network, or other secure network. In some forms, the network device can be joined to multiple networks or combination of networks while joined to the energy network. In other forms, the network device can be joined to only the energy network. In still other forms, an AMI network connection can be established to enable an AMI network to access the network device, and the network device can unjoin or disconnect the AMI network and

join the energy network. In another form, information received from the AMI network can be used to alter an operating condition of the network device using the energy network. Various other permutations of joining a network device to an energy network or other networks can also be realized as needed or desired.

[0098] According to a further aspect, a network device can join the energy network using a standardized profile, such as a Zigbee profile. In addition, a network device can be joined using a profile modifier that can extend the functionality of the Zigbee profile associated with a specific network device. For example, a controller establishing the energy network can access profile modifiers to enhance use of a specific network device.

[0099] According to a further aspect, an AMI network can be joined during a period of time, and then the energy network can be joined during a separate time period. As such, various combinations of joining a network device to one or more networks can be used as needed or desired to manage energy use of a network device. Additionally, the method can be modified to join additional network devices to one or more networks as needed or desired. Upon joining one or more network devices, the method can proceed to block 320 and then to decision block 322.

[00100] At decision block 322, the method can detect whether a proximity mode associated with a site and energy network is enabled or disabled. For example, proximity mode can include associating a mobile device with a residential site, and automatically controlling a network device based on detecting a location the mobile device may be from the residential site. One or more mobile devices associated with a site can include a location reporting device capable of outputting a location report. The location reporting device can use various technologies to report location including GPS, GPRS, cell tower triangulation, or various other location reporting technologies. In another form, a location reporting device of a mobile device can also include a WIFI radio capable of being connected to a WIFI network. As such, a mobile device can be connected to a WIFI

network at the site using a WIFI connection, and as a WIFI connection is established or lost, a proximity mode can be enabled and disabled accordingly.

[00101] According to an aspect, at block 322 if proximity mode is enabled, the method can proceed to block 344 as described below. If at decision block 322 proximity mode may not be enabled, the method can proceed to decision block 324 to detect if a user schedule is available. For example, a user schedule can include an event schedule to control one or more network devices. According to an aspect, one or more user's can create a schedule that can be accessed by a controller, and used to control one or more wireless thermostats or other network devices that can be joined to the energy network. According to a further aspect, a user schedule can be linked to a mobile device of the user. In some forms, the mobile device can include a location detection device configured to report locations of the mobile device.

[00102] According to an aspect, if a user schedule may not be detected, the method can proceed to block 356 and an event can be identified. For example, an event can include one or more programmed events that can be created and accessed at a specific time, date, period, or other to alter an operating condition of a network device. For example, a user may not have provided a user schedule to schedule energy use of a hot water system at a residence. As such, a default schedule can be accessed to identify an event and schedule or manage use of the hot water heater. For example, an event can include decreasing a hot water heater ten (10) degrees at midnight. Another event can include increasing a hot water heater fifteen (15) degrees at five (5) A.M. In another form, a network device can include a wireless thermostat that can be used to control an HVAC system based on a time of day or other attribute. For example, a weather forecast can be determined, and an event can be scheduled to adjust a wireless thermostat accessible to the energy network. Various other environmental conditions, grid conditions, user profiles, device profiles, energy pricing, or any combination of energy management information can be used to schedule or create an event.

[00103] Upon identifying an event, the method can proceed to decision block 326 and detect whether to schedule the event. For example, if an event is configured to be scheduled at a specific time of day, the method can detect the event at decision block 326. If an event may not be detected, the method can proceed to decision block 322 and repeats.

[00104] According to an aspect, if at decision block 326 an event should be scheduled, the method can proceed to block 328 and the event can be scheduled. For example, a network device can be identified, an operating condition to be altered can be identified, a time of day to alter the operating condition can be identified, a period of time to alter an operating condition can be identified, a device profile can be used, or any combination of data that can be used to schedule an event can be used. According to another aspect, the method can include initiating a scheduled event at block 328 using a portion of a programming schedule stored within a memory of the controller associated with the energy network. For example, portions of event data can be communicated from a remote server to the controller, and used with a programming schedule stored within the controller to schedule an event. In this manner, one or more sources can be used alone or in combination to schedule events.

[00105] According to a further aspect, upon scheduling the event, the method can proceed to block 330 and a control action can to be communicated to a network device. For example, a control action can include control action data or device data sufficient to alter an operating condition of a network device. In some forms, data formatted according to a standard profile, such as a Zigbee Home Automation profile, Zigbee Energy Profile, and the like. In other forms, control action data can include a device identifier, a message format to output a message, a parameter or feature of a network device to alter, an updated set-point or operating condition of the network device, a network or security key, a date and time, or any combination thereof.

[00106] According to an aspect, the method can proceed to block 332 and the control action can be output to the energy network as an outgoing message and received by the network device as an incoming message. For example, the network device can detect the outgoing message communicated within the energy network using a unique identifier of the network device.

[00107] At block 334, upon the network device receiving the incoming message, a control action can be extracted from the incoming message and the operating condition at the network device can be altered using the control action data. For example, an dishwasher may be turned on, a clothes washer or dryer turned on, lights within a home can be altered, a thermostat can be adjusted, a hot water heater can be adjusted, or various other types of control actions can be initiated as needed or desired.

[00108] At block 336, network device data can be obtained from the network device using the energy network. For example, a network device can receive a request to output operating status information as network device data to the energy network. In other forms, the network device can be enabled to periodically publish status information to the energy network and received by the controller. Upon outputting the network device data, the method can then proceed to block 338 and a site report can be generated. For example, a site report can include network device data received from one or more network devices accessible to the home energy network. Site report data can be stored locally to the controller, and processed to confirm an updating of the control action. The site report data can be stored within a site report and communicated to a remote server configurable to receive and process the site report data within a site report. According to an aspect, a site report can be communicated to a remote server configurable to receive site reports from the controller using a broadband connection initiated by the controller. Other forms of communication can also be used to communicate a site report as needed or desired. Upon generating a site report, the method can proceed to decision block 302.

[00109] According to an aspect, if at decision block 322 proximity detection may be enabled, the method can proceed to block 344 and a location report can be received. For example, a location report can include location data output from a location reporting device such as a mobile device. In other forms, a location report can be generated in response to a detection that a mobile device having a WIFI radio may be within range, or out of range, of the WIFI network at the site. As such, the method can be used to alter an operating condition of the network device using the energy network in response to detecting the location reporting device establishing or losing a WIFI connection to the WIFI network.

[00110] According to an aspect, the method can proceed to decision block 346 and can detect if a location change has occurred. If a location change has not occurred, the method can proceed to block 348 and detects whether to alter an operating condition. If an operating condition of one or more network devices may not be altered, the method can proceed to block 350, and to block 322.

[00111] According to another aspect, if at decision block 346 a location change may be detected, the method can proceed to block 350 and detects a distance a location reporting device may be from an associated site. The method can then proceed to block 352 and detects the direction of the mobile device. For example, if the distance has increased from a previous location reported, the method can detect that a user may be moving away from a site. In other forms, a detected direction can include moving toward a site, moving away from a site, or not moving at all.

[00112] Upon detecting a direction, the method can proceed to decision block 348 and detects whether to alter an operating condition of a network device. For example, in addition to detecting a distance and direction a user may be from a residence, various other types of information can also be used to alter an operating condition. For example, data such as real time velocity data, average velocity data, estimated length of time a user may

take to return to a site, thermostat scheduling data, network device scheduling data, site report data, real-time weather condition data, traffic condition data, user driving pattern data, daily driving pattern data, GPS mapping data, home energy efficiency ratings, demand response data, curtailment data, energy pricing data, grid condition data, various other types of LMI, or any combination thereof.

[00113] Upon detecting an operating condition to alter, the method can proceed to block 354 and initiates a control action. For example, a server remote to a site can be used to generate a control action that can be included within a control action report and communicated to the controller at the site. In a form, the control action report can be communicated in association with an upload of a site report. According to another aspect, a control action can be generated by the controller. For example, a location and direction of a mobile device can be identified and communicated to the controller. The controller can then determine whether to generate a control action using the location data and direction data, and possible other data as needed or desired. The method can then proceed to block 328 as generally described above. If at decision block 348 an operating condition of a network device should not be altered, the method can proceed to block 350 and to block 322.

[00114] According to an aspect, the method can be provided to detect a distance between the location reporting device and the site using a previously stored location of the residence and a new location of the location reporting device. At decision block 354 altering an operating condition can include altering an operating condition of the network device in response to detecting the location reporting device is travelling away from the residence. Further, altering an operating condition of the network device in response to detecting the location reporting device is travelling toward the residence.

[00115] According to another aspect, the method can be provided to detect a location reporting device at a first distance at block 350, and at decision block 348 initiate a control action. As the location reporting device may be detected at a second distance, a

second control action can be initiated. For example, a control action can include setting a first temperature set-point of a thermostat in response to detecting the first distance. The method can further be provided to detect the location reporting device at a second distance different from the first distance, and set the temperature set-point to a second value.

[00116] According to a further aspect, the method can be modified to detect an upper and lower thermostat set-point limits of a network device. For example, an upper set-point limit can include a maximum a temperature that should be reached within a site during a warm season. A set-point of a thermostat can then be determined by determining the difference between a previous set-point and the maximum set-point. In some forms, a percentage adjustment, such as 30%, 50%, 75%, etc. of the resulting difference between a maximum set-point and a base set point can be used to determine a new set-point. For example, if a thermostat is set to seventy (70) degrees and has a maximum set-point of eighty (80) degrees, the delta between the two being ten (10) degrees. A new set-point can then be generated by multiplying this delta by a percentage, such as 50%, and adding it to the current set point. In this example, a new setting of seventy five (75) degrees would be the resulting set-point. In other forms, the method can use the maximum and minimum set-points, resulting or current set-points, in association with a time of day, a distance or distances a user may be from a site, or various other data that can be used to determine a set-point using maximum and minimum set-point values.

[00117] FIG. 4 illustrates a block diagram of an energy management apparatus, illustrated generally as controller 400, according to an aspect of the disclosure. Controller 400 can include a processor 402 and memory 404 configurable to store data. Memory 404 can be configured as on-board memory of processor 402, or in other forms can also include expandable memory such as DDR memory, Flash Memory, EPROM, ROM, or various other forms, or any combination thereof generally illustrated as memory 404.

[00118] According to an aspect, controller 400 can include buses 406, 408, 410 configured to couple data and signals to various components within controller 400.

Although illustrated as multiple buses 406, 408, 410, controller 400 can include a single bus, multiple buses, or any combination thereof. Various types of bus configurations can be used as needed or desired including, but not limited to, any combination or portion of a serial bus, a parallel bus, a serial – parallel bus, a universal serial bus, industry standard bus, controller area network bus, a serial peripheral bus, a universal asynchronous receiver transmitter bus, a control bus, standard digital input output bus, or any combination thereof.

[00119] According to an aspect, controller 400 can also include a communication interface 430, an information network interface 416, an external bus interface 420, an application program interface 440, or any combination thereof configurable to be coupled to one or more of buses 406, 408, 410 or any combination thereof. According to an aspect, any combination of interfaces 430, 416, 420, 440 can be configured in any combination of hardware, software, or firmware, and can include any combination or portion of a serial bus interface, a parallel bus interface, a serial – parallel bus interface, a universal serial bus interface, industry standard bus interface, controller area network bus interface, a serial peripheral interface, a universal asynchronous receiver transmitter interface, a control bus interface, standard digital input output interface, or any combination thereof.

[00120] According to a further aspect, controller 400 can also include a power supply 412 capable of providing power to controller 400. Power supply 412 can be an internal power supply and in other forms can be provided external to controller 400. Controller 400 can also include a broadband device 414 configured to be coupled to a broadband network. For example, broadband device can include an Ethernet communication module, a Cable or coaxial-based communication module, and can include communication logic to receive and transmit data between controller 400 and an information network such as a LAN, WAN, local network, the Internet, and the like.

Broadband device 414 can include TCP/IP communication capabilities and can also be security enabled to transmit SSL data between controller 400 and an information network.

[00121] According to a further aspect, controller 400 can also include an information network interface 416, a wireless information network device 418, and an external bus interface 420. Controller 400 can also include a Zigbee enabled communication device 422, a WII/I device 424, an Advanced Metering Infrastructure device 426, a support and updates module 428, and a communication interface 430. Controller 400 can also include an operating system 450 that can be executed by processor 402.

[00122] According to an aspect, controller 400 can be configured to use any type or combination of wireline or wireless communication to manage energy use at a site, including, but not limited to, power-line communication, wire line communication, wireless communication, Zigbee based communication, INSTEON based communication, X10 based communication, Z-Wave based communication, WiMAX based communication, Bluetooth based communication, WIFI based communication, 802.11-based communication, 802.15-based communication, 802.16-based communication, proprietary communication, other communications described herein, or any combination thereof.

[00123] According to a further aspect, controller 400 can include a network device profile module 432, a security module 434, a controller module 436, and a proximity detection module 438. Controller 400 can also include device profiles 442, user profiles 444, home profiles 446, and profile modifiers 448. One or more of the modules, profiles, or any combination thereof can be provided as encoded logic such as a ROM, PROM, EPROM, EEPROM, or various combinations thereof and accessible to processor 402 as needed or desired. In other forms, one or more of the modules, profiles, or any combination thereof can be stored within a memory device such as memory 404, within a

removable flash drive (not expressly illustrated in FIG. 4), an external data storage device (not expressly illustrated in FIG. 4), or any combination thereof.

[00124] According to further aspect, controller 400 can include processor 402 operable to manage energy use at a site. Processor 400 can be configured to convert an incoming message received from a wireless energy network (not expressly illustrated in FIG. 4) into XML enabled output data. Processor 400 can also format an outgoing message to be output to a wireless energy network using XML enabled input data. According to an aspect, XML enabled input data includes a network device identifier of a network device accessible using a wireless energy network. Controller 400 can also include communication interface 430 configurable to enable access to communication device, such as Zigbee device 422, WIFI device 424, AMI device 426, or any other device accessible to controller 400 and having access to a wireless energy network. According to an aspect, communication interface 430 can be configured to detect an outgoing message formatted by processor 402 and configure the outgoing message to a message bus format that can be coupled to bus 408 and a communication device such as Zigbee device 422. For example, outgoing message can include network device data configured to be output to a wireless energy network, but processed into a message bus format prior to outputting to a communication device. Communication interface 430 can then convert the outgoing message from a message bus format to a format that can be output by a specific communication device. For example, if the outgoing message was intended to be output using WIFI device 424, communication interface can detect that the message was to be sent on a WIFI network and can convert the outgoing message from a message bus format to a WIFI device format. Communication interface 430 can then output the WIFI device formatted message to WIFI device 424.

[00125] According to a further aspect, communication interface 430 can be configured to detect an incoming message received from a wireless energy network using a communication device such as Zigbee device 422, WIFI device 424, AMI device 426, or

any other device accessible to controller 400 and having access to a wireless energy network. Incoming message can include incoming network device data received from a network device. Communication interface 430 can convert an incoming message from a communication device format to access an incoming network device data received from a network device, and output the incoming network device data using a message bus format that can be used by processor 402.

[00126] According to another aspect, controller 400 can include a wireless data module, such as Zigbee device 422, WiFi device 424, AMI device 426, or any other device accessible to controller 400 and having access to a wireless energy network. A wireless data module can be accessible to processor 402 and configured to generate profile data to be used with an outgoing message. For example, processor 402 can access network device profile module 434 and use a network device profile of a network device accessible to the wireless energy network to output a message receivable by a specific network device. Network device data can be formatted using a network device profile of a specific network type of the wireless energy network. In some forms, a network device profile may not include information sufficient to output network device data. As such, profile modifiers 448 can be provided and can include profile modification data of the network device not available within the network device profiles 442 that can be used to communicate with a network device coupled to an energy network accessible to controller 400.

[00127] For example, device profiles 442 can include a Zigbee thermostat device profile having home automation profile data and smart energy profile data. Profile modification data 448 can be used to access additional profile information to format an outgoing Zigbee message and access a Zigbee enabled thermostat coupled to a wireless energy network accessible to controller 400. In this manner, additional features and functionality that may not exist within Zigbee profile standards can be accessed by using

profile modifier data 448. As such, functionality of a Zigbee enabled device can be expanded beyond a standard Zigbee profile.

[00128] According to another aspect, controller 400 can include a first user profile stored within user profiles 444 and accessible to processor 402. For example, a first user profile can include a first time schedule to operate a network device and a control setting to control the network device. User profiles 444 can also include a first user identifier to identify a first user and can also include a network device identifier to identify the network device to control or alter.

[00129] According to another aspect, controller 400 can include a second user profile within user profiles 444 and accessible to processor 402 that is different than the first user profile. A second user profile can include a second time schedule to operate a network device and at least one control setting to control the network device. The second user profile can also include a second user identifier to identify the second user and a network device identifier to identify the network device.

[00130] According to a further aspect, processor 402 can determine when to use a first user profile or a second user profile. For example, processor 402 can access user profiles 444 to detecting the user profiles, and initiate outputting an outgoing message using the first user schedule or the second user schedule. Processor 402 can then be used to monitor when to alter the operating condition provided by the first user schedule, to an operating condition of a second user schedule. In this manner, multiple user schedules can be used by controller 400 to control a network device.

[00131] According to a further aspect, processor 402 can be used to detect an input to a network device as a user schedule is being used, and store a new setting of the network device in association with the deployed user schedule. For example, processor 402 can detect a current user profile being used, and further detect an interaction with a network device during use of a first user schedule. Upon detecting an interaction,

processor 402 can initiate an update to the first user profile in response to detecting the interaction.

[00132] According to an aspect, processor 402 can be used to convert data received using broadband device 414 to a format that can be output to a wireless energy network. Also, processor 402 can also be configured to convert data received from the wireless energy network to a format that can be used by broadband device 414. For example, processor 402 can include a Linux enabled processor configured to convert an incoming message received from Zigbee device 422 to an XML enabled output data. Additionally, processor 402 can format XML enabled input data received from broadband device 414 to an outgoing Zigbee message that can be output using Zigbee device 422.

[00133] According to a further aspect, controller 400 can be configured as a server and can deploy several processes of applications that can be used, including, but not limited to Ubuntu Version 9.04, Java SE Version 6, "lighttpd HTTP Server", Servlets, FastCGI, Apache log4j, Eclipse, Apache Ant, or any equivalent operating environments or software, or any combination thereof.

[00134] According to an aspect, processor 402 using a Java operating environment can initiate generation of a Java output object using XML enabled input data received from broadband device 414. The Java output object can include network device data of a ZigBee enabled network device accessible to a wireless energy network and Zigbee device 422. Processor 402 can further initiate generation of XML enabled output data from an incoming message received from Zigbee device 422 using a Java input object configured to accesses network device data using a network device profile stored within device profiles 422, and a profile modifiers 448 as needed or desired.

[00135] According to an aspect, controller 400 can use communication interface 430 and API 440 to enable access to ZigBee device 422 operably coupled to bus 408 and accessible to API 440. As such API 440 can be used by processor 402 during use of one

or more modules to access Zigbee device 422, WIFI device 424, AMI device, 426 or any combination thereof to communicate network data using a wireless energy network. As such, processor 402 can make API calls to API 440 to access various functions of one or more communication devices 422, 424, 426.

[00136] According to another aspect, controller 400, can be used to coordinate a wireless energy network, and use data within the wireless energy network that was received from an external information source accessible to controller 400. For example, broadband device 414 can be coupled to an information network. Broadband device 414 can further be coupled to information network interface 416 operable to access external data sources that can be communicatively coupled to broadband device 414. Controller 400 can initiate coordinating a wireless energy network, and initiate outputting XML enabled output data as site report data to information network interface 416 to be communicated to an external data source using broadband device 414. Site report data can include a portion or representation of network device data received by Zigbee device 422, or other device accessing the wireless energy network. According to an aspect, controller 400 can also receive control action report data using broadband device 414. For example, control action report data can include XML enabled input data that can be output as network device data using the wireless energy network.

[00137] According to a further aspect, controller 400 can be configured to access a wireless energy network at more than one security level. For example, processor 402 can use security module 434 configured to initiate supporting coordinating a wireless energy network at a first security level and enable access to a network device at a first security level. For example, processor 402 can initiate receipt of an incoming message using Zigbee device 422 at the first security level. Upon gaining access and communicating device data, processor 402 can disconnect the network device. In another form, security module 434 and processor 402 can then initiate access to a second network device at a second security level using Zigbee device 422, and enable access to the second network

device using the second security level. Processor 402 can initiate receipt of a second incoming message at the second security level, and upon receipt of device data disable access to the second network device. As such, controller 400 can use a single Zigbee device 422 to access multiple network devices using more than one security level.

[00138] According to an aspect, controller 400 can be used to access more than one wireless energy network. For example, processor 402 can initiate using a first wireless communication device, such as Zigbee device 422, to coordinate a first wireless energy network. Processor 402 can also initiate using a second wireless communication device, such as a second Zigbee device (not expressly illustrated in FIG. 4), or other wireless device, to coordinate a second wireless energy network. As such, processor 402 can access one or more network devices coupled to one or more wireless energy networks. According to another aspect, a second Zigbee device, or other wireless device can be used to join a second wireless energy network instead of coordinating the second wireless energy network. For example, the second wireless energy network can include an advanced metering infrastructure (AMI) enabled network operably associated with an AMI enabled smart meter. AMI device 426 can include a second ZigBee device, or other wireless communication device, capable of joining an AMI enabled network of an AMI enabled smart meter (not expressly illustrated in FIG. 4). As such, smart meter data can be accessed by controller 400 as needed or desired. For example, AMI data or smart meter data can be obtained on a periodic basis and communicated in association with a site report having network device data. As such, broadband device 414, wireless information network device 418, or other information network devices can be used to site report data that can include AMI data acquired using controller 400.

[00139] According to another aspect, controller 400 can use AMI device 426 to access an AMI enabled smart meter to alter an operating condition of a network device accessible to controller 400 using Zigbee device 422. For example, AMI device 426 can include an advanced metering infrastructure (AMI) enabled interface capable of initiating

access to an AMI enabled smart meter. Controller 400 can use AMI device 426 to receive AMI data from an AMI enabled smart meter. Processor 402 can be used to initiate altering an operating condition of a network device in response to detecting AMI data received from the AMI enabled smart meter. Processor 402 can further be used to detect a smart energy control request output by an AMI enabled smart meter, and initiate using the smart energy control request at the network device.

[00140] In some forms, a control request may be obviated by controller 400 by not allowing an AMI initiated control request to be enabled. For example, processor 402 can access home profiles 446 and determine whether a control action initiated by an AMI enabled smart meter should be enabled or disabled. As such, controller 400 can be used to monitor control actions being output by an AMI enabled smart meter or other utility provided system, and alter the request as desired. For example, a user may create a home profile 446 that would not allow for a curtailment action of a network device. In other forms, home profile 446 may enable a curtailment action over a period or schedule, and disable a curtailment action over another period or schedule. As such, controller 400 can determine a valid period or schedule to enable and disable a curtailment action initiated by an AMI enabled smart meter.

[00141] According to a further aspect, controller 400 can reset an operating condition in the event an AMI enabled smart meter alters an operating condition of a network device. For example, an AMI enabled smart meter may be able to control a network device. Controller 400 can monitor an operating condition of the network device, and in the event an operating condition has been altered to a setting that is not scheduled by controller 400, controller 400 can respond to the operating condition by notifying a user, or automatically altering the operating condition to a preferred setting.

[00142] According to another aspect, controller 400 can be used to access an information network outside of the wireless home energy network. For example, information network interface 416 can be configured to access an information network

using broadband device 414, wireless information network device 418, external bus interface 420, or any combination thereof. According to an aspect, wireless information network device 418 can include a subscriber based network device, or in other forms can include a WIFI network access device, or various combinations thereof. According to an aspect, wireless information network device 418 can include WIFI device 424 that can be used to access an information network. As such, WIFI device 424 can be used to access an information network, an wireless energy network, a local wireless information network, or any combination thereof.

[00143] According to an aspect, controller 400 can use WIFI device 424 to be coupled to a WIFI enabled communication device such as a mobile device, smart phone, home computer, laptop computer, Netbook, or any other WIFI enabled device capable of connecting to a WIFI network. Communication interface 430 and processor 402 can be used to enable a WIFI enabled communication device to access network device data, site data, or any combination of data accessible using the wireless energy network. Control actions can also be requested using the WIFI enabled communication device and connection to control a network device coupled to the wireless energy network accessible by controller 400. For example, a mobile device access a WIFI network can be used to access a wireless energy network having a network device. In other forms, controller 400 can include a web server capable of communicating web services that can be accessed by a mobile device (or other system or device), via a web based environment. For example, controller 400 can output portions or all of a graphical user interface as described in FIGs. 7-10 herein, or other graphical user interfaces that can be output by a web server. As such, a user having a WIFI enable communication device can be coupled to controller 400 using WIFI device 424 and monitor, create and manage operating conditions, home profiles, user profiles, device profiles, user schedules, proximity detection, demand response preferences, energy savings preferences, other control settings, view site data, or any combination thereof. Other settings and operating conditions can be accessed, monitored, or managed as needed or desired.

[00144] According to another aspect, controller 400 can include proximity detection module 438 that can be accessed by processor 402 to enable and disable proximity control at a site. For example, proximity detection module 438 and processor can be used to detect a distance between a mobile device having a location reporting device and the site. Processor 402 can be used to identify a current operating condition of a network device, and identify an updated operating condition of the network device in response to the detected distance. Processor 402 can be used to initiate generation of an outgoing message to include an updated operating condition in response to the distance. According to a further aspect, controller 400 can be configured to receive location data using an information network having a server configured to communicate location data associated with a mobile device having a location reporting device that is associated with a site. Location data can be stored within memory 404 and used to monitor a distance and direction between a site and the mobile device. As such, controller 400 can initiate control actions using the location data, and the location data need not be stored in a server remotely located to a site. Various control actions can be generated using various types of conditions including detecting a distance, determining a control zone having a distance or interval, travel pattern of a mobile device, monitoring current and future weather data, monitoring real-time traffic data, monitoring energy pricing data, monitoring home efficiency data, or using any combination of energy management information in association with providing proximity control of a site.

[00145] According to an aspect, controller 400 can include a plug computer employing a Linux based server configured to manage energy use at a site. For example, controller 400 can include a Java enabled processor as processor 402, memory 404 configured to store incoming and outgoing wireless energy network messages, Zigbee device 422 capable of accessing a wireless energy network, and information network interface 416 capable of initiating communication with an information network. Controller 400 can also include communication interface 430 operably coupled to bus 408

and Zigbee device 422 coupled to bus 408. Through utilizing a Java enabled processor and Linux operating system, controller 400 can deploy a web server (not expressly illustrated in FIG. 4) and a Java environment to handle and convert XML data received using a web server into Java objects that can be used to communicate network device data and various other types of data.

[00146] For example, processor 400 can be used to convert an incoming message received from a wireless energy network using the Zigbee device 422 into XML enabled output data. Processor 402 can format an outgoing message to be output to a wireless energy network using XML enabled input data that includes a network device identifier of a network device accessible using a wireless energy network. Communication interface 430 can be configured to detect the outgoing message formatted by processor 402 to be output using the wireless energy network, and configure the outgoing message to a message bus format to be output to communication bus 408. In some forms, the outgoing message can include network device data configured to be output to a wireless energy network. Communication interface 430 can further detect an incoming message received from a wireless energy network that includes incoming network device data. Communication interface 430 can be used to convert the incoming message accessed from bus 408 from the message bus format to detect incoming network device data that can be output to processor 402. Processor 402 can then be used to generate site data including the network device data, and a site report that can be communicated using information network interface 416.

[00147] FIG. 5A illustrates a block diagram of a mobile device, generally illustrated at 500, according to an aspect of the disclosure. Mobile device 500 can be configured as a smart phone or handheld computer, tablet, and the like such as an iPhone® device, a BlackBerry® device, an Android® device, an iPad® or various other devices or systems. Mobile device 500 can include a processor 502, a memory 504, an I/O device 506 such as a keypad, touch screen, function buttons, a mini qwerty board, or any other type of input

device capable providing control of mobile device 500 or any combination thereof. I/O devices 506 can also include a speaker for outputting sound, and a microphone for detecting sound. Mobile device 500 can also include a display 508 such as color LCD display, touch screen display, or any combination thereof. According to a further aspect, one of more of I/O devices 506 can be displayed within display 508 having touch screen capabilities, such as selectable GUI elements that can be used to control features, functions, or various other application of mobile device 500. As such, mobile device 500 can be configured to use numerous applications that output graphical elements configurable to control mobile device 500 and applications accessible by mobile device 500.

[00148] According to a further aspect, mobile device 500 can also include an energy management application 510 accessible to processor 502 and configured to enable a user to manage energy use of at a site in a mobile environment. Mobile device 500 can also include a location reporting device 515, such as GPS technology, cell tower location technology, triangulation technology or any combination thereof. Portions of location reporting device 515 can be located within mobile device 500 however in other forms, a wireless network can include functionality that can be selectively accessed to detect a location of mobile device 500.

[00149] According to a further aspect, mobile device 500 can also include a network interface 514 configurable to enable access to a WIFI device 516, a Bluetooth device 518, a ZigBee device 520, or any combinations thereof. According to a further aspect, mobile device 500 can also include a wireless data network device 522 that can be configured with one or more RF radios capable of connecting to one or more wireless networks such as a 3G network, 4G network, PCS network, EDGE network, cellular network, or any combination thereof.

[00150] As illustrated in FIG. 5B, mobile device 500 can also include an energy management user interface 530 capable of being displayed within display 508. Energy

management user interface 530 can include a user information section 532 that can display various types of user data such as a location of a site being managed, an energy provider providing energy to the site being managed, an energy personality of the user based on the user's interaction with energy use at the residential site, or various other types of user profile information.

[00151] According to a further aspect, energy management user interface 530 can include a current readings section 534 configured to display a current readings and operating conditions of a site. For example, current readings can include a current inside temperature, outside temperature, proximity setting, energy alert setting, savings rate, status of network devices being managed such as lights, HVAC system, hot water heater system, sprinkler system, refrigerator system, washing machine system, distributed energy generation system such as a solar array, battery storage device, fuel cell, wind turbine generator, or any combination thereof. Other network devices can also be managed as needed or desired. Current readings section 534 can include a selectable graphical element that can be selected to access additional site information. Site information displayed within current readings 534 can be accessed from a remote server capable of managing or storing site reports that include site data and device data. In other forms, site information, current reading, operating conditions, or any combination thereof can be accessed using a WII4 device 516 of mobile device 500.

[00152] According to a further aspect, energy management user interface 530 can include a current settings section configured to enable a user to alter an operating condition of a network device being managed. For example, current settings section 536 can include current setting of one or more thermostats at a site, settings of any other network device being managed at a site. Current settings section 536 can also include general settings to manage a site. For example, a general setting can include a proximity detection setting, a demand response setting, an energy alerts settings, a savings setting, schedules, calendars, events, a vacation setting to enable a vacation schedule, or any other

type of setting that can be used to manage energy consumption or network devices at a site, or any combination thereof. Current settings section 536 can also include a graphical element that can be selected to access additional settings as needed or desired.

[00153] According to a further aspect, energy management user interface 530 can include a current savings section 538 configured to enable a user to access energy savings information and adjust as needed or desired. For example, an energy savings amount obtained at a site can be realized. A user may also be able to access an energy saving selector (not expressly illustrated in FIG. 5B) to modify an energy savings level. For example, a user can change a savings level to low, medium, high, or various other savings metrics. According to another aspect, a user may access a vacation mode (not expressly illustrated in FIG. 5B) and alter an operating condition of a site by selecting a vacation mode using mobile device 500. As such, various energy savings settings can be selected as needed or desired.

[00154] According to a further aspect, mobile device 500 can provide proximity updates, site report requests, site control commands, configuration data, settings, scheduling data, text messages such as SMS, MMS and others, and various other types of information or data or any combination thereof that can be used with an energy management system. According to another aspect, mobile device 500 may not have full functionality or capabilities of a smart phone or other device capable of running an application. For example, a mobile device such as a cell phone may not be capable of loading an application such as an energy management application. However, the mobile device may have sufficient functionality to allow an energy management system to contact the mobile device. For example, an adverse operating condition may be detected at a site (e.g. temperature set-point of thermostat is out of range, lights are left on, etc.). As such, the energy management system can identify the mobile device and send a message, such as a text message, an email message, or any combination thereof, capable of being received and displayed by the mobile device. In some forms, a user can receive the

message and respond to the message, enabling the user to control the operating condition of the network device at the site. For example, the user can respond to the message via a text message, an email message, or another messaging application accessible to the mobile device. As such, a mobile device that may not be able to run energy management application 510 can be used to control an operating condition at an associated site.

[00155] During operation, a user can access operating status and generate control actions to control a network device (not expressly illustrated in FIG. 5A or 5B) at a site. For example, mobile device can receive and send messages, such as text messages, HTTP enabled messages, XML enabled messages, email messages, data, or any combination thereof. For example, if an outside temperature at a site is increasing or forecasted to increase, and the price of energy is increasing or scheduled to increase, mobile device 500 can receive a message to inform the user of the condition. The user can respond to the message as desired. In other forms, a suggestion can be sent to the user. For example, a suggestion to increase a thermostat or indoor temperature by three degrees can be received by mobile device 500. Upon receiving the message, the user can respond to the message using a text or other messaging technology. In other forms, a user can access energy management application 510 and initiate a control action to adjust the thermostat to different set-point. In this manner, a user can become aware of a current operating or forecasted condition in a mobile environment, and respond as needed or desired.

[00156] According to another aspect, mobile device 500 can include a portion or all of energy management application 510 running in the background, in the foreground, or any combination thereof. According to an aspect, energy management application 510 can be launched automatically when a message or energy alert may be received by mobile device 500.

[00157] According to a further aspect, energy management application 510 can be operable to work with an energy management system to update a control action field within a database. For example, mobile device 500 and energy management application

510 can initiate updating a control field within a database to identify a control action. Energy management application 510 can further update a new set-point within the database. As such, an energy management system can generate a control action report or data during a site upload. In this manner, a user of mobile device 500 can update control setting using a remote server or energy management system, and control actions can be generated to alter an operating condition at a site.

[00158] According to another aspect, energy management application 510 can output recommendation settings of a network device to the user. For example, a user can select a low savings, medium savings, or a high savings at a residential site using current settings 536. A user can select a savings level, and mobile device 500 can communicate a message to an energy management system associated with the site and mobile device 500 to generate a control action to alter an operating condition at a site based on a savings level setting. For example, an energy management system can calculate new settings of one or more network devices, intervals to set the network devices, start and stop times, and the like. In some instances, settings can be determined based on a forecasted weather, forecasted energy pricing, forecasted energy availability, proximity of mobile device 500 from a site, or various other types of data. Settings can be stored within a database and control actions can be initiated as needed or desired.

[00159] According to a further aspect, an energy alert message received by mobile device 500 can be used to alter or display an energy status icon, alter an application icon, alter a status within a social network, or various combinations thereof. For example, a user can then select the energy status icon using mobile device 500 and an associated application can be presented to a user to allow a user to alter an operating condition as desired. In some forms, a user's election to reduce energy consumption during peak times or other times can be fed into their social network as an energy savings message or update. A user's energy personality can also be output from mobile device or associated web service to be updated within a social network as needed or desired.

[00160] According to a further aspect, mobile device 500 can include proximity detection module 524 operably associated with energy management application 510 and location reporting device 512. Proximity detection module 524 can be provided as a part of energy management application 510, location reporting device 512, may be provided as a separate module, or any combination thereof. According to an aspect, proximity detection module 524 can be used with location reporting device 512 to detect a distance mobile device 500 may be from an associated site. For example, proximity detection module 524 can be operated as a background process that periodically requests a location from location reporting device 512. Location reporting device 512 can use various location reporting methods (e.g. GPS, triangulation, etc.) to detect a current location, and an associated API of location reporting device 512. According to an aspect, proximity detection module 524 can request an accuracy of a location to be provided by location reporting device 512, and a response time. For example, if a GPS signal may not be available to mobile device 500, location reporting device 512 can be requested by proximity detection module 524 to detect a location using a triangulation technique or other technique within 500 milliseconds. In another form, proximity detection module 524 can alter reporting parameters of location reporting device 512 in response to a relative location mobile device 500 may be from an associated site. For example, mobile device 500 may be greater than five (5) miles from an associated site, and location reporting device 524 can alter a distance accuracy, response time, method used, or various other location reporting parameters that can be selected.

[00161] According to another aspect, proximity detection module 524 can be used to initiate altering an operating condition of an associated site in response to a location of mobile device 500. For example, proximity detection module 524 can be used to detect mobile device 500 being greater than two miles away from an associated site, and a direction that is moving away from an associated site. Proximity detection module 524 can output a location and direction to energy management application 510, and energy

management application 510 can detect whether to initiate a control action at an associated site.

[00162] According to a further aspect, proximity detection module 524 can be used to detect a location at a modifiable interval (e.g. one (1) minute, five (5) minutes, etc.) to reduce the amount battery drain or power consumption of mobile device 500. For example, as mobile device 500 may be moving away from an associated site, and an interval to access location data using location reporting device 512 can be increased (e.g. set from one (1) minute to three (3) minutes). In another form, as mobile device 500 moves closer to an associated site, proximity detection module 524 request at location from location reporting device 512 at a shorter interval (e.g. set from five (5) minutes to (1) minute). Various combinations of intervals can be deployed as needed or desired. In other forms, energy pricing at a period of time can also be used to alter reporting of a location reporting device 512. Various other combinations of using data to alter reporting of a location can also be used as needed or desired to reduce battery consumption or other operating conditions of mobile device 500.

[00163] According to a further aspect, proximity detection module 524, energy management application 510, or another portion of mobile device 500, or any combination thereof can be used as an energy management system. For example, an energy management system, such as energy management system 200 illustrated in FIG. 2, energy management system 600 illustrated in FIG. 6, an energy management system located at a site, hosted within a network, a apparatus or device capable of energy management, or any combination thereof can be used. According to an aspect, an energy management system can receive location data reported by location reporting device 512, and alter an operating condition of mobile device 500 based on a relative location mobile device 500 may be from an associated site. As such, an energy management system can be used to alter an operating condition of mobile device 500.

[00164] According to another aspect, sampling of location reporting device 512 can be updated using energy management application 510, an energy server operably associated with mobile device 500, or any combination thereof. For example, mobile device 500 can be detected by an energy management system as being between three and five miles from a site. An energy management system or application can further detect mobile device 500 travelling away from an associated site. As such, access to location reporting device 512 can be reduced thereby reducing energy consumption of mobile device 500.

[00165] According to a further aspect, a user of mobile device 500 may enter a building where a location based signal, such as a GPS signal, may not be able to be accessed or have limited access. As such, a sampling interval of location reporting device 512 may be altered to conserve energy. Upon a user exiting a building and a location of mobile device 500 being detected, a sampling interval can be returned to a previous value or a new value as needed or desired. According to further aspect, a sampling interval can be sent to mobile device 500 from another source such as an energy management system. In other forms, updated sampling intervals can be stored within mobile device 500 and accessed as needed or desired. In other forms, a distance from a site, a sampling interval, direction, or various combinations of data can be communicated to mobile device 500 to be used to alter access to location reporting device 512.

[00166] According to another aspect, mobile device 500 can include software trap routines to be used when a location may go undetected. For example, energy management application 510 can use proximity detection module 524 that accesses location reporting device 512 to obtain a location. However, if a location is not obtained, or invalid, or any combination thereof, a software trap routine can be used to keep the proximity module, or background process from exiting. In this manner, energy management application 510 and various modules, associated processes, or any combination thereof can be

continuously run without having to receive valid location data, and terminating the background process.

[00167] According to a further aspect, mobile device 500 can incorporate various portions or functionality of energy management system 200, controller 300, energy management system 600, wireless thermostat 1200, or various other systems, apparatuses, modules, GUI's or any combination thereof described herein as needed or desired to manage energy use in a mobile environment using mobile device 500. Additionally, mobile device 500 can use various types of data accessible to mobile device 500 including, but not limited to EMI data disclosed herein. According to an aspect, an application icon (not expressly illustrated in FIG. 5B) can be provided in a association with energy management application 510. For example, an icon can be used to access energy management application 510 can in some forms, can be altered to display energy consumption information, settings information or various other types of information without a user having to launch energy management application 510. For example, energy management application 510 can alter text information (e.g. device settings, current readings, lights on/off, etc.). An example can include displaying a current thermostat setting of a thermostat at a site, altering a color of an icon based on an energy savings or consumption level, alter a color based on proximity information, display a current temperature within a site, or various combinations thereof. As such, a user need not launch an energy management application 510 to EMI data associated with a site.

[00168] FIG. 6 illustrates a block diagram of an energy management system, generally illustrated at 600, according to another aspect of the disclosure. Energy management system 600 can include a server 602 operable to be coupled a site 604. Server 602 can include a processor 606 and a database 608. Server 602 can include an external data source interface 610 that can be coupled to an external data source 612 using a network connection 614. External data source 612 can include one or more data sources capable of providing access to EMI data, various other types of data, or any combination

thereof. According to a further aspect, external data source 612 can also include third party sources. For example, an external data source 612 can include subscription based, non-subscription based, or any combination thereof of data having weather conditions, traffic conditions, grid operating conditions, wholesale energy prices, real-time energy pricing, dynamic pricing information, fixed pricing information, forecasted energy pricing, forecasted energy consumption, forecasted energy production, alternative energy production, distributed alternative energy production, zonal demand or operating conditions, nodal demand or operating conditions, or other EMI data that can be accessed using a third party.

[00169] According to a further aspect, server 602 can also include a network interface 616 that can be coupled to a network location 618 using a network connection 620. Network location 618 can be used to access to EMI data, various other types of data, or any combination thereof. Server 602 can also use network interface 620 to access a public network, a private network, a semi-private network or any combination thereof. According to an aspect, network interface 616 can include a network communication device (not expressly illustrated in FIG. 6) and a web server operable to enable access to the Internet or other communication network. Server 602 can also include a site interface 622 that can be coupled to site 604 using a network connection 624 operable to be coupled to a home controller 626. According to an aspect, site interface 622 can be realized as a web services based application configured to receive information initiated by site 604.

[00170] According to an aspect, site 604 can also include a wireless thermostat, TSTAT 628, operably coupled to NVAC system, HVAC 630. Site 604 can further include a mobile device 632 associated with site 604. Mobile device 632 can be coupled to a mobile client interface 634, such as a WAP or other mobile device gateway capable of communicating using a mobile information network 636. According to an aspect, energy management system 600 can be operably to provide a first zone 638 having a first distance 640, and a second zone 642 having a second distance 642. First zone 638 and second zone

642 can be used to control TSTAT 628 and HVAC 630. For example, first zone 638 and second zone 642 can be provided as a boundary that can be determined in various ways to control one or more energy consuming devices at site 604.

[00171] According to another aspect, server 602 and processor 606 can include one or more processors having one or more core processors. Server 602 can also use any combination of software modules, firmware, encoded logic, or any combination thereof to manage energy use. For example, server 602 can use a scheduling module 648, a scheduling tool module 650, a scheduling templates module 652, a control action report module 654, a site data report module 656, an efficiency rating module 658, a set-point update module 660, a proximity detection module 662, a zone update module 664, a current readings module 666, a demand response module 668, an energy savings module 670, a message module 672, an interaction detection module 674, an energy personality module 678, or any combination thereof.

[00172] According to an aspect, database 608 can be configured to store EMI data, control action data, site report data or any combination thereof. For example, database 608 can store data received from one or more residential sites associated with server 602. For example, site 604 can access TSTAT 628 using a wireless energy network deployed at site 604. Processor 606 can be configured to access site report data stored within database 608. Processor 606 can detect a current temperature set-point within the site data and an associated date and time of TSTAT 628 at site 604. Processor 606 can detect a current temperature reading at site 604, and can further detect seasonal settings stored within database 608. For example, a seasonal profile can include seasonal settings that can include settings of a winter schedule, a summer schedule, or various combinations of seasons and settings. According to an aspect, processor 606 can detect a current operating mode of HVAC 630 operably coupled to TSTAT 628, and determine a thermostat schedule to be used with TSTAT 628. For example, if HVAC 630 may be in an A/C mode, a summer profile, schedule and the like can be deployed which can include

temperature settings that can be different than a winter profile. For example, scheduling module 648 can be used to determine a date, a time or time interval, thermostat setting, operating mode, or any combination thereof, and store a schedule within database 608.

[00173] According to another aspect, server 602 can also generate control action reports using control action report module 654. For example, processor 606 can initiate generation of a control action report to communicate to site 604. A control action report can be generated in various ways with various types of data and settings to control an operating environment at site 604. For example, a control action report can be generated by setting a control action field within database 608.

[00174] According to a further aspect, energy management system 600 can use seasonal settings to control HVAC 630. For example, energy management system 600 can detect an operating mode of HVAC 630 and alter a set-point in using the detected operating mode and an associated seasonal profile. For example, an updated temperature set-point can include a value between a current temperature set-point and a minimum seasonal set-point in response to the current operating mode of HVAC 630 being in a heating mode. An updated temperature set-point can also have a value between a current temperature set-point and a maximum seasonal set-point in response to the current operating mode of HVAC 630 being in a cooling mode. Server 602 can generate a control action report that can also includes settings or data generated in response to an efficiency rating of site 604, an estimated time period to generate an updated temperature reading, an updated temperature set-point, a current energy price, and a future energy price or any combination thereof.

[00175] According to another aspect, server 602 can be used to generate a control action report using proximity detection module 662. For example, processor 606 can detect a distance between a location reporting device, such as mobile device 632 and site 604. Processor 606 can further detect a zone, such as first zone 638, second zone 642 or additional zones as desired. Using a detected zone, processor 606 can initiate generation

of a control action report to be communicated to site 604 in response to a current zone. In this manner, various network devices (not expressly illustrated in FIG. 6) at site 604 can be automatically controlled on a zone by zone basis as mobile device 632 moves away from, or towards, site 604.

[00176] According to another aspect, one or more of the zones 638, 642, additional zones (not expressly illustrated in FIG. 6), or any combination thereof can be updated automatically using updated conditions. For example, processor 606 can use a zone update module 664 on a periodic basis to update zones using various types of data. For example, processor 606 can detect an efficiency rating of site 604, detect an external temperature at site 604 from an external data source 612 or other sources, determine a real-time travel time between mobile device 632 having location reporting capabilities and site 604. Processor 606 can modify distance 640, 644, or any combination thereof. For example, an efficiency rating of site 604, external temperature at site 604, estimated real-time travel time to or from site 604, various other FMI, or any combination thereof can be used. Although illustrated as being sequential, zones 638, 642 can be modified independently, together, or any combination thereof.

[00177] According to another aspect, server 602 can use proximity detection module 662 to detect when mobile device 632 may be moving away from site 604, and adjust HVAC 630 using thermostat 628. For example, processor 606 can detect mobile device 632 moving away from site 604. Processor 606 can further detect a percentage change value associated with a current zone, and further detect a base set-point of TSTAT 628. Processor 606 can further determine a difference between the base set-point, and a minimum seasonal set-point in response to a current operating mode of the HVAC 630. For example, if the HVAC 630 is in a heating mode a percentage change can be determined to adjust use of a heating unit.

[00178] According to a further aspect, server 602 can determine a difference between a base set-point and a maximum seasonal set-point in response to a current

operating mode of the HVAC being in a cooling mode. As such, processor 606 can determine an updated thermostat set-point as a percent change based on the determined difference. Processor 606 can initiate generation of a control action report including an updated thermostat set-point to be used at site 604.

[00179] According to another aspect, server 602 can be used to generate an aggregated demand schedule. For example, processor 606 can determine energy demand of a plurality of residences in a region using scheduling module 648. For example, processor 606 can identify a group of residential sites within a specified region (not expressly illustrated in FIG. 6) and access thermostat schedules of each of the residential sites within the group. Processor 606 can also aggregate scheduling data using thermostat schedules, and initiate an outputting of the aggregated scheduling data. Aggregated scheduling data can include time intervals, settings, etc. and in some forms can also include an estimate of energy consumption based on an efficiency rating of residential sites, consumption profiles, location data, or various other site attributes that can be used to calculate an aggregated demand. According to an aspect, aggregated data can be used to forecast load, energy production, virtual capacity, demand response capacity, grid congestion, or any combination of grid attributes that can use aggregated scheduling data.

[00180] According to another aspect, energy management system 600 can also include a web services enabled scheduling tool to schedule energy use at a residential site. For example, processor 606 can use scheduling tool module 650 to generate a web based or network based graphical user interface that includes a scheduling tool. FIG 8A-D illustrate examples of a web services enabled scheduling tool and user interfaces that can be output using scheduling tool module 650. For example, processor 606 can output a thermostat selector configurable to enable selection of one or more wireless thermostats located at site 604. An event scheduler operably associated with the thermostat selector and configurable to enable a user to graphically select a utilization schedule of the one or more wireless thermostats can also be output by processor 606. Processor 606 can also be

used to update a utilization schedule to include a time of day and temperature setting. Scheduling tool module 650 can be used to control the one or more network devices that can include wireless thermostats, smart appliances and the like. Scheduling tool module 650 can be used to output an energy savings preference selector configured to graphically modify the utilization schedule, and display a resulting energy savings, a weather forecasting tool, and various other types of tools or scheduling features to assist in managing or scheduling use of a network device.

[00181] According to another aspect, server 602 can also use interaction detection module 674 to detect when a user may alter an operating mode of a network device. For example, interaction detection module 674 can detect when a user may adjust a thermostat at a specific time of the day, and suggest a modification of a utilization schedule to a user during a user access to scheduling tool output using scheduling tool module 650. A user can then elect to have the utilization schedule updated to include the suggestion as needed or desired.

[00182] According to another aspect, server 602 and scheduling tool module 650 can be used to enable additional features and functions. For example, a scheduling tool can be used to display a proximity control selector configured to enable and disable proximity control of a residential site, a demand response selector configured to enable and disable participation in demand response event, a vacation mode selector to enable and disable a vacation schedule, an auto update selector configured to enable an automatic update of the utilization schedule in response to a detection of a user interaction with the one or more network device, or various other controls that can be used to manage energy use at a site, or any combination thereof.

[00183] According to another aspect, server 602 and scheduling tool module 650 can be used to enable and disable demand response capabilities. For example, a scheduling tool can be used to provide a demand response selector (not expressly illustrated in FIG. 6) operable to be displayed with a scheduling tool. A demand response selector

can include several settings such as an always participate selection configured to always enable a curtailment of an HVAC system in response to a demand response event, a never participate selection configured to not allow a curtailment of the HVAC system in response to a demand response event, a request participation selection configured to initiate a communication, such as an email, text message, instant message, social network message, or various combinations thereof to the user to request participation in a demand response event. A demand response selector can be operably associated with demand response module 668 to initiate demand response inquiries, analyses, and deployments.

[00184] According to another aspect, server 602 can also use scheduling template module 652 to generate utilization templates that a user can access and modify to schedule energy use. For example, a plurality of energy templates can be accessed by a scheduling tool. Templates can include a predetermined utilization schedule selectable by the user based on a user's scheduling profile. A selected predetermined utilization schedule can be modifiable by a user using a scheduling tool module 650, and saved as needed or desired. According to an aspect, server 602 can output an on-line questionnaire or survey that a user can participate in to determine an energy template to use.

[00185] According to a further aspect, server 602 can also use energy personality detection module 678 to detect an interaction profile of a user. For example, a user may be an urban professional having a long work commute which may result in a first portion of a utilization schedule. Upon arriving at a residential site, a user may interact with their thermostat to which will result in a different portion of a utilization schedule. For example, a user may like an indoor temperature to be colder when going to bed. As such, a personality of the user while away and while at home can be used to automatically generate a user's schedule. According to another aspect, an energy personality indicia or character can be generated and output with a user's on-line scheduling tool, within a user's social network, or any combination thereof. For example, processor 606 can detect an interaction of a user with a wireless thermostat, and display of an energy personality

indicia in response to the interaction. A user can then enable or disable display of the energy personality indicia within a social network such as Facebook®, MySpace®, etc.. In other forms, processor 606 can be used to modify the indicia based on an overall energy savings a user has accomplished at their residential site. For example, processor 606 can use energy savings module 670 to determine an energy savings of the individual and alter the energy personality indicia accordingly. In another form, a user can set up a messaging service or account using Twitter ® and the like to output energy savings updates to a subscriber base in response to an energy saving initiate, participating in demand response events, alter energy use, or various other forms. According to a further aspect, a Twitter ® account or other messaging service can be used on a community basis to inform a group of individuals of energy management events. For example, an “energy action day” or “energy alerts” can be posted using a Twitter ® account to subscribers and a subscriber can curtail energy use using energy management system 600 or various other energy management systems as needed or desired. Other forms of messaging or any combination thereof can be used as needed or desired.

[00186] According to another aspect, server 602 can be used to determine a sample size of residential sites and corresponding schedules to forecast energy consumption over an interval. For example, processor 606 can be used to determine a random sample size of residential sites in connection with estimating an energy consumption of a specific region such as a zip code, street or series of streets, substations supporting residential sites, node-to-node, or any combination thereof or other methods of determining a region. Upon identifying a sample size of a region, residential sites can be identified within the region. For example, processor 606 can then determine associated thermostat schedules of residential sites within the specified region using scheduling module 648. Server 602 can output thermostat scheduling data of the plurality of sites in connection with scheduling or forecasting energy use.

[00187] According to another aspect, server 602 can also be used to enable a demand response initiated at site 604. For example, processor 606 can use demand response module 668 to detect an enabled demand response setting of site 604. Processor 606 can further detect a demand response event condition and enable a curtailment action of HVAC 630 if a user of site 604 has selected participation in a demand response event. An energy reduction capacity of site 604 can be determined using efficiency rating module 658, scheduling module 648, proximity detection module 662, or various other modules, data sources, or any combination thereof.

[00188] According to another aspect, server 602 can also use demand response module 668 to contact individuals prior to curtailing energy use at site 604. For example, processor 606 can initiate a demand response event request communication to communicate to the users of a plurality of sites. Processor 606 can detect a user response level to participate in a demand response event, and enable a curtailment of a corresponding HVAC system or other energy consuming devices at a site of a user electing to participate in the demand response event. In this manner, user's may not be forced to participate in demand response events but can have real-time election capabilities to participate as needed or desired.

[00189] According to an aspect, server 602 can send a text message that includes a request to participate in a demand response event. In some forms, a text message can include an agreement to pay the user to participate in a demand response event. Payment can take various forms such as credits, cash, rewards, points, contribution to education funds, discounts on energy rates, or any combination thereof. Server 602 can receive a response from using mobile client interface 634 and process the response using message module 672 to determine a desire to participate or not.

[00190] According to another aspect, server 602 can be used with scheduling module 648 to determine an aggregate capacity to reduce energy consumption. For

example, processor 606 can be used to identify a group of residences within the plurality of residences and determine an energy reduction capacity of each of the residences within the group using an efficiency rating of each of the residences within the group. Upon determining an efficiency rating of each residence, processor 606 can detect other data to be used to determine an available capacity. For example, current weather conditions at each residential site can be detected, a user's energy schedule or thermostat schedule can be used, a response to text messages or emails electing to participate can be determined, grid conditions can be used, or any combination thereof. Upon estimating an available capacity, an aggregate energy reduction capacity based on the energy reduction capacity of each of the residences within the group can be determined.

[00191] According to another aspect, server 602 can use an aggregate energy reduction capacity in association with an auction. For example, processor 606 can initiate an auction of virtual energy capacity to retail energy providers electing to bid an available energy capacity. In other forms, a third party can host an auction and energy management system 600 can output an available capacity in association with an upcoming auction event, peak demand period, transmission rate determination period, or any combination thereof. For example, processor 606 can initiate an auction process to sell the aggregate energy reduction capacity to a third party, and detect a sale of the aggregate energy reduction capacity in connection with the auction process. Upon a sale occurring, processor 606 can initiate a curtailment of an HVAC system, other energy consuming devices, or any combination thereof, at each of the residences within the group.

[00192] According to another aspect, energy management system 600 can include mobile client interface 634 operable to be coupled to mobile device 632 associated with site 604. For example, mobile client interface 634 can include a WAP gateway or other mobile client gateway to enable server 602 access to mobile device 632. Mobile client interface 634 can be provided as a part of server 602, however in other forms, portions or all of mobile client interface 634 can be provided by a specific wireless network provider.

As such, mobile client interface 634 can be configured to communicate with a specific carrier having a WAP gateway. Mobile client interface 634 can be used to communicate EMI or control data between WAP gateway and server 602 using any combination wireless or terrestrial communication technologies. Additionally, WAP gateway can also include logic or modules that can provide mobile device users access to EMI data or control data generated by mobile device 632, server 602, energy management system 600, or any portions and combinations thereof.

[00193] According to an aspect, mobile client interface 632 can receive a site readings request of site 604 from mobile device 632. For example, processor 606 can detect the site reading request and initiate access to database 608 to retrieve site report data of site 604. Processor 606 can format the site report data as mobile device data, and output the mobile device data to mobile device 632 using mobile device network 636.

[00194] According to another aspect, mobile client interface 634 can receive a request from mobile device 632 to modify a current temperature set-point of HVAC system 630. For example, processor 606 can process a received request from mobile device 632 and initiate generation of a control report using control action report module 654. The control action report can include a reference to an updated temperature set-point communicated from mobile device 632 to mobile client interface 634. Processor 606 can set a variable or field within database 608 to alter a set-point. Upon site 604 initiating access to server 602, processor 606 can access a variable or field associated with site 604, and generate a control action report or control data to be communicated to site 604 using site interface 622. As such, upon a temperature set-point being updated at site 604, home controller 626 can communicate a control action confirmation data, site report, status information, or various combinations thereof to confirm the updated temperature set-point. Processor 606 can output a confirmation of the updated temperature set-point to the mobile client interface 634 upon receiving a confirmation, and can output an updated temperature set-point to mobile device 632.

[00195] According to another aspect, mobile device 632 can be used to enable and disable operating modes of one or more network devices located at site 604. For example, mobile device 632 can include a mobile application loaded on mobile device 632 that can be used to control settings at site 604. FIG. 5A and B illustrate examples of energy management application and functionality that can be used by mobile device 632 although other applications and functions can also be deployed using mobile device 632 as needed or desire. According to another aspect, mobile device 632 can access a web based application associated with server 602 using a web browser of mobile device 632 to enable and disable operating modes or conditions at site 602. For example, mobile device 632 can alter a proximity setting, alter one or more environmental control zones, access current readings, modify a vacation setting, modify energy use schedules, or various other operating modes or data associated with controlling or maintaining operating modes of network devices located at site 604 as needed or desired.

[00196] According to another aspect, energy management system 600, can be used to send messages to mobile device 632 in connection with an altered operating condition at site 634. For example, processor 606 can access site data received from site 604, and further detect a manual input condition provided at TSTAT 628. For example, a user may have decreased a temperature set-point of TSTAT 628. Processor 606 can detect whether a user is at home using location data received from mobile device 632 and proximity detection module 660. Upon detecting the condition, processor 606 can determine if it should initiate a text message indicating the manual input condition. For example, processor 606 can use message module 672 to format and output a text message indicating the condition change of TSTAT 628, and output the text message using mobile client interface 634. A user can then alter the condition using mobile device 632 as desired. In other forms, an email message or other electronic message can also be sent to a user. For example, a message can be displayed within a window of a computer system associated with the user. In other forms, a text message can be sent to multiple mobile devices

associated with site 604. Various other combinations of alerting a user of site 604 of a manual change to an operating condition can be used as needed or desired.

[00197] FIG. 7 illustrates an energy management user interface (EMUI), illustrated generally at 700, according to an aspect of the disclosure. In some forms, EMUI 700 can be accessed using a mobile device, desktop computer, Netbook, laptop computer, smart phone, a energy display device, a smart thermostat, a home automation control terminal, and iPad ® or any combination of devices capable of displaying energy management user interfaces.

[00198] According to an aspect, EMUI 700 can include a user information section 702 configured to display one or more user names 704, a residential site address 706, a mobile phone number 708 associated with residential site address 706. User information section 702 can further display a current energy provider 710 associated with residential site address 706, and a current best rate 712 of a third party energy provider available at residential site address 706. An advertisement 714 section can also be displayed, and an edit details link 716 can be displayed to enable a user to access, edit, modify, delete, manage, etc. information displayed within user information section 702. FIG 9 described herein includes an example of a user interface that can be used to edit user information displayed within user information section 702. User information section 702 can also display an energy personality 740 associated with user name 704. Energy personality 740 can also be linked to one or more social networks as needed or desired.

[00199] According to a further aspect, a current readings section 718 can be displayed within EMUI 700. Current readings section 718 can include, for example, a current date and time section 720 with a current inside temperature and outside temperature at a residential site. Current readings section 718 can further include a current thermostat set-point 722 of a thermostat located at a residential site. More than one thermostat can be deployed at a residential site and current thermostat set-point 722 can include references such as "Main", "2", "3" or some other indicia configured to enable

access to current thermostat readings of multiple thermostats at a residential site. A user can also modify the name or number of a thermostat, zone, etc. using an edit feature of thermostat set-point 722.

[00200] According to a further aspect, a current readings section 718 can also include an energy savings level 724 configured to indicate a savings level that relates to current thermostat set-point 722. For example, as current thermostat set-point 722 is set to a low set-point, an air conditioner unit may run more frequently and cause a low energy savings. As such, a visual indication of an energy savings can be displayed in association with a current set-point giving a user feedback on energy consumption based on a thermostat set point. In some forms, a user can adjust a thermostat set-point up or down, and an energy savings level can be altered in near real-time based on the users selection. For example, various programming languages such as DHTML, AJAX, Flash, HTML 5, and the like can be used to show a near real-time update of one or more fields within EMUI 700.

[00201] According to a further aspect, EMUI 700 can also include a demand response notification selector 726 configured to enable participation in demand response events, disable participation in demand response events, and enable a text message (or other messages) to be sent to a user to request participation in a demand response event. According to a further aspect, EMUI 700 can also include a proximity detection selector 728 configured to enable proximity detection of one or more mobile devices associated with a residential site.

[00202] According to another aspect, EMUI 700 can also include an energy usage / savings section 730 that can display a current annual savings 732, a current monthly savings 734, a demand response savings 736, and a view more data link 738. According to an aspect, view more data link 738 can be operably associated with accessing portions or all of EMUI 800 described in FIG. 8.

[00203] FIG. 8 illustrates an energy management user interface operable to report energy usage and savings information, illustrated generally as EMUI 800, according to a further aspect of the disclosure. According to an aspect, EMUI 800 can include an energy usage / savings section 802, operable to display a current annual savings 804, a current monthly savings 808, and a current demand response savings 808 realized by a user participating in demand response events. EMUI 800 can also include an estimated annual savings section 810, a managed vs. unmanaged energy consumption graph 812, and a comparative consumption graph 814. According to an aspect, a user can select a comparison graph that includes a community graph configured to compare a user's energy consumption to others in a residential community, a state comparison graph configured to compare a user's energy consumption to others within a state, and a national graph configured to compare a user's energy consumption to a current national average.

[00204] According to a further aspect, EMUI 800 can also include a daily usage graph 816 configured to indicate energy consumption and savings on an hour-by-hour basis. For example, if a user selects a medium energy savings settings, daily usage graph can display a daily savings in dollars, KWh or any combination thereof. Daily usage graph 816 can further include a graph indicated what the consumption would have been if energy use was left unmanaged. According to a further aspect, daily usage graph 816 can also include a day selector 818 configured to enable a user to select a day of the week to view energy consumption and savings.

[00205] According to another aspect, EMUI 800 can also include a monthly usage and savings graph section 820 configurable to output monthly energy usage and savings information of each day of the month. For example, a monthly graph can include a daily, weekly, or other pairing bar graph configured to display a monthly energy usage and savings at a residential site. A user can navigate between a month using month selector 822 and a specific month's consumption and savings graph can be displayed. In some instances, only a portion of a specific month's data may be available to be displayed. As

such, only a portion of a graph may be displayed as desired. According to a further aspect, monthly usage and savings graph section 820 can also include an link to access annual savings as needed or desired.

[00206] According to another aspect, EMUI 800 can further be used to access and display performance data of an adjacent home, a similar sized home, one or more of the same or similar energy consuming devices (e.g. HVAC, hot water heater, other smart appliances), or any combination thereof. EMUI 800 can compare performance of each of the other residences and devices, and provide feedback to a user about the user's relative performance. For example, EMUI 800 can output a visual indication of power consumed, such as a graph, chart, etc. In other forms, a comparable residential site can also be displayed using EMUI 800. For example, a same or similar sized home can be used as a baseline comparison.

[00207] In other forms, EMUI 800 can be used to enable a user access to energy efficient devices and systems, and a user can forecast energy reduction and savings through use of an energy efficient system. As such, energy consuming devices that may be introduced and have a greater efficiency rating can be identified and communicated to a consumer. According to another form, EMUI 800 can display a click-through or micro-site to allow a user to access third party product energy efficient offerings. In other forms, EMUI 800 can enable access to a "green energy" marketplace that will enable a user to review energy efficient products and services. Such products and services can be selected by a user and associated XML data, meta data, and the like can be fed into EMUI 800. EMUI 800 can be configured to use the third party data and refresh data displayed within EMUI 800 to display an estimated saving if used at the user's residential site. As such, EMUI 800 can determine an estimate of what energy savings may be for their residential site, allowing a user to make an informed purchase decision. For example, a user may wish to add a solar array or other type of energy producing system to their residential site. EMUI 800 can be used to estimate the amount of energy that may be saved based on a

user's actual historical energy use. As such, a payback period associated with purchasing can be displayed to a consumer.

[00208] FIG. 9 illustrates an energy management user interface (EMUI) operable to access and edit user and site information, illustrated generally at 900, according to a further aspect of the disclosure. EMUI 900 can include a user profile 902 configured to display and enable a user to edit changes to user information. User profile 902 can include a user selector 904 configurable to add and remove user's associate with a site, a user name field 906, an energy personality type field and/or indicia 908, a social network selector 910, a residential site address 912, and a mobile number 914 associated with a residential site address 912. According to a further aspect, user profile 902 can also include an energy text message alert selector 916, a proximity detection selector 918, and a current HVAC provider information field 920.

[00209] According to an aspect, user selector 904 can be configured to enable a user to select a user data to edit. For example, multiple users can be associated with a residential site and a user's information can be accessed by selecting user selector 904. In other forms, a user can log into a web site or other application and may only be able to have limited access to user specific data associated with a residential site. According to another aspect, user information selector 904 can be used to add additional users to be associated with a residential site. As such, a master user or administrator login can form (not expressly illustrated in FIG. 9) can be provided to manage user information. In some aspects, a user profile 902 can include pre-populated information to reduce the amount of information a user may need to input. Additionally, information associated with the residential site can be accessed and used with the additional user as needed or desired.

[00210] According to a further aspect, EMUI 900 can also include an energy provider section 922 which can include retail, utility, or third party energy information. For example, a current energy provider can be displayed and a current energy rate and plan currently being used can also be displayed. Energy provider section 922 can also

indicate a best rate plan at a current provider, and a best local rate available through another provider. Energy provider section 922 can also include a savings calculator element 934 capable of initiating a savings calculation of the residential site using a best available rate of a current provider, other providers, or any combination thereof. Savings calculator element 9434 can also use historical site data, scheduling data of the residential site, forecasted energy consumption, future energy pricing, or various other FMI or any combination thereof to determine annual savings. Site consumption can then be used to determine what an overall cost of energy would be when using a given rate plan. Other intervals (e.g. monthly, weekly, daily, etc.) can also be calculated as needed or desired. As such, a user can identify a plan that would align with usage habits and scheduling data at a residential site.

[00211] According to a further aspect of the disclosure, EMUI 900 can also include a user posting and reviews section 924. User posting and reviews section 926 can include a content selector 926 capable of selecting energy blogs, green energy reviews, markets and the like. For example, as a user selects 'My Energy Blogs,' a list of energy blog titles can be displayed including a user energy blog 928 configured to enable a user to edit and publish their own energy blog. A user can publish their energy blog to an energy blog websites, social networks, third party sites, content providers, or any combination thereof. A third party energy blog 930 can also be listed within user posting and reviews section 926 allowing third party bloggers, articles, content providers, RSS feeds, Twitter @ Feeds, or any combination thereof, to provide content. According to an aspect, a user can add a blog, news feed, social network, Twitter @ account, etc. to user posting and reviews section 926 as desired. User selector within user posting and reviews section 924 can allow a user can to select between user content associated with a site and read/write/access privileges can be enabled and disabled accordingly.

[00212] According to a further aspect, user posting and reviews section 926 can also include a 'Green Energy Reviews' section configured to review energy saving products,

environmentally friendly products, green energy producing systems, or any combination thereof. User posting and reviews section 926 can also include a 'Markets' section configured to enable a user to access green energy product websites or marketplaces having green energy products. For example, a marketplace can be used to consolidate available green energy products, such as smart appliances, and further identify third party pricing and websites selling green energy products. As such, a user can read reviews of new energy saving products and access the energy products using user posting and reviews section 926. In some instances, EMUI 900 can be used to enable E-commerce between a posting site within markets section, green energy reviews section, retail energy providers, etc. allowing a firm hosting EMUI 900 to be paid a portion of revenue resulting from a sale.

[00213] FIG. 10 illustrates an energy management user interface (EMUI) operable to schedule energy use at a residential site, illustrated generally as EMUI 1000 according to a further aspect of the disclosure. EMUI 1000 may be illustrated in association with managing one or more user schedules, thermostats, HVAC systems, zones, sites or any combination thereof. In other forms, EMUI 1000 can be modified to schedule energy use of various energy consumption devices at a site as needed or desired. Additionally, portions or all of EMUI 1000 can be accessed using a computer system capable of accessing the Internet, can be configured as mobile application that can be used with a smart phone or handheld computer, tablet, and the like such as an iPhone® device, a Blackberry® device, an Android® device, an iPad® or various other devices or systems, or any combination thereof.

[00214] According to an aspect, EMUI 1000 includes a thermostat display 1002 configured to enable a user to adjust a temperature of one or more thermostats located at a residential site. Thermostat display 1002 can include a date and time display, a thermostat selector 1004, and a thermostat controller 1006. EMUI 1000 can also include a savings selector 1008 configured to enable a user to select a low savings level, a medium savings

level, or a high savings level. Savings selector 1008 can be operably associated with an estimated savings display 1010 and a scheduling tool 1012. For example, a user can select a low savings using savings selector 1008 and an estimated savings can be calculated and displayed within estimated savings display 1010. According to a further aspect, a user can select a savings level using savings selector 1008. As such, resulting thermostat settings can be displayed within scheduling tool 1012 thereby providing a user a visual indication of a resulting temperature setting. According to a further aspect, savings selector 1008 can also be operably associated with scheduling tool 1012 to display more than one temperature setting at a time. For example, a low savings may result in a temperature setting of sixty-five degrees, a medium savings may result in a temperature setting of sixty-eight degrees, and a high savings level may result in a temperature setting of seventy-four degrees. Various combinations of values and display techniques can be used as needed or desired.

[00215] According to a further aspect, scheduling tool 1012 can include a seasonal schedule capable of allowing a user to schedule energy use based on a season (e.g. spring, summer, fall, winter). For example, a first site may be located in a hot climate and a second site may be located in a cold climate. As such, an air conditioner may be used more frequently during the summer months in a hot climate and can be associated with a schedule being displayed. A user can select between a seasonal schedule using scheduling tool 1012, and a schedule can be updated accordingly to display a winter schedule. Various other seasonal schedules can be added and removed as needed or desired. In other forms, scheduling tool 1012 can be used to access a current operating mode of an HVAC system and display a seasonal schedule in response to detecting an operating mode. For example, if an HVAC system may be operating in a heat mode, a winter schedule can be displayed. Other seasonal schedules can also be displayed within scheduling tool 1012 as needed or desired.

[00216] According to a further aspect, scheduling tool 1012 can include a current inside and outside temperature display 1014, and a schedule selector 1016 capable of displaying a user schedule of a first user, a second user, a vacation schedule, or any combination of schedules. For example, a user may use scheduling tool 1012 to schedule energy use at multiple sites. As such, scheduling tool can display a second site associated with a specific user. Additional schedules can be added as needed or desired, and access privileges also can be set by a current user using user information profile such as user profile 902 illustrated in FIG. 9 or any other privileges or logic capable of setting access privileges.

[00217] According to a further aspect, scheduling tool 1012 can also include a weekly schedule display section 1018, and a time span display section 1020 configured within a schedule 1022. Weekly schedule display 1018 can also be configured to show current dates or a series of dates, and can further include forecasted weather conditions of each day. A user can navigate to another week by selecting tab 1024 configurable to enable a subsequent weekly schedule to be displayed as desired. According to further aspect, schedule 1022 includes a plurality of cells generally illustrated at scheduled events 1026 that can be modified as desired to schedule energy use. Schedule events 1026 can include a time interval and setting of a network device, such as a thermostat, being scheduled. A cell can also include an indicator, such as 'adapt?' indicator 1028 to identify an auto-schedule suggestion detected by an energy management system operably associated with EMUI 1000. For example, when a user may be at a site, a user may desire to have a temperature decreased to seventy eight degrees on Saturday prior to nine (9) P.M. As such, an auto-schedule suggestion can be detected and an adapt? indicator 1028 can be displayed to enable a user to have a schedule adapted automatically. Adaption suggestions can be provided to users in other ways and need not be limited to being displaying within schedule 1022.

[00218] According to a further aspect, EMUI 1000 can also provide access to view templates selector 1030 that can be used to schedule energy use. For example, view templates selector 1030 can be used to display predetermined schedules within scheduling tool 1012. A user can then modify portions of a selected template to their preference as needed or desired. In other forms, a series of questions can be asked to a user to determine a template to display. For example, scheduling tool 1012 can enable access to a short questionnaire to detect a user's day-to-day schedule. For example, a user can be an urban professional, a housewife, a single parent, a soccer mom, an empty nester, or various other demographics. As such, EMUI 1000 can be adapted to hide scheduling tool 1012 until a survey or series of questions is completed, and then display a resulting schedule within scheduling tool 1012.

[00219] According to a further aspect, EMUI 1000 can be adapted to display a list of selectable templates and can allow a user to select and display each template. Upon identifying a template, a user can then save an identified template as a user schedule. In some forms, a user's site location can be determined in advance and templates can be generated based on a location of a site (e.g. warm climate vs. cold climate). As such, view templates can be generated based on a site profile, a user profile, user characteristics, site data, or various other types of data capable of being used to generate a template that can be used by a user.

[00220] According to a further aspect, scheduling tool 1012 can also include an add additional time span selector 1034 configured to enable a user to add an additional time span within time span display section 1020. Scheduling tool 1012 can also include a view additional time slot selector 1032 configured to enable a user to scroll to additional time slots that may be output using scheduling tool 1012. For example, a user can select additional time slot selector 1032 and scheduling tool 1012 can be updated to display scheduled events of each day simultaneously. In this manner, a user can scroll additional time slots and days of the week as needed or desired.

[00221] According to a further aspect, EMUI 1000 can also include a proximity detection selector 1036. For example, a user may enable proximity detection using proximity detection selector 1036, and energy use at a site may be altered based on a user's distance to the site. A user's mobile device number can be associated with a site and can allow a user to enable and disable proximity detection selector 1036. In some forms, proximity detection selector 1036 can be hidden, displayed, selectable, or any combination thereof in response to a user having a mobile device capable of being detected when a user is at or away from a site.

[00222] According to another aspect, EMUI 1000 can include an energy alert text message selector 1038 configured to enable a text message to be sent to a user's mobile device. For example, during a high energy use day, an energy action day may be identified and a utility company or other entity may publish a warning indicating that a high energy use day may be occurring. As such, a user can receive a text message indicating the situation. In some forms, a user can respond to the text message and alter their energy use schedule. For example, a user can respond to a request to alter their energy savings setting from a medium to a high. As such, scheduling tool 1012 can be modified to initiate a high energy savings schedule at a user's site. In other forms, energy alert text message selector 1038 can be used to enable a user to receive demand response requests via a text message. For example, a demand response request can include a requested time interval, new temperature setting, estimated savings, other demand response data, or any combination thereof within a text message. A user can then respond to the text message to participate, not participate, partially participate, or any combination thereof. Upon responding, a user's schedule can be modified as needed or desired.

[00223] According to a further aspect, EMUI 1000 can also include a vacation mode settings 1040 to enable a user to initiate use of a vacation mode or schedule. For example, vacation mode settings 1040 can include a vacation mode selector 1042 to turn a vacation mode on or off. Vacation mode settings can also include a schedule leave date

selector 1044 and a schedule return date selector 1046. A calendar (not expressly illustrated in FIG. 10) can be displayed to enable a user to select an interval of dates when they will be on vacation. As such, reduced energy use can be realized by altering a temperature setting. For example, a schedule can be increased to a high energy saving mode in association with the vacation mode being selected. In other forms, a user may have input or selected a vacation schedule to be used when vacation mode may be selected. Various combinations can be used as needed or desired.

[00224] During use, upon a user accessing EMUI 1000, EMUI 1000 can display a current date and time, and can further highlight a current cell within scheduling tool 1012 that corresponds to a current data and time. A user can select a thermostat to adjust using thermostat selector 1004, and a schedule of a selected thermostat can be displayed within scheduling tool 1012. A user can adjust a current set-point using thermostat controller 1006, and a corresponding temperature within a current cell can be adjusted accordingly. In another form, a user can select a cell to be modified. For example, a user may want to modify a temperature setting or scheduled event set for Tuesday, between eight (8) A.M and five (5) P.M. As such, a user can select the appropriate cell and further adjust a temperature up or down using thermostat controller 1006. A new setting can be displayed within the selected cell. According to a further aspect, a user can use savings selector 1008 to adjust a savings to be realized on a specific day. As such, a resulting temperature setting can be displayed within a selected cell.

[00225] In other forms, a user can select a time span cell to adjust. For example, a user can modify a current time span cell by selecting a specific cell. Upon selection of a specific cell, scheduling tool 1012 can highlight which cells may be affected by modifying a time interval. A user can then modify an interval accordingly as needed or desired.

[00226] According to a further aspect, a user can select a day of the week to modify. For example, a user can select 'MON' and a background color can be altered to indicated that each of the MON cells can be modified. In a form, a user can update each cell as

desired, can alter one or more, or all MON cells using savings selector 1008 as needed or desired.

[00227] According to another aspect, EMUI 1000 can be used to activate a one or more schedules. For example, a first user schedule can be activated over a period of time and then a second user schedule can be activated over another period of time. A user can also activate a vacation schedule that include an scheduled events to optimize energy savings when nobody is present at a site. In other forms, a first user schedule can be compared to a second user schedule, and events at a site can be scheduled accordingly. For example, a first user schedule may be active during an evening time and may override a second user schedule. In other forms, a second user schedule may be activated in the morning to accommodate an individual that may remain at home during the day. As such, EMUI 1000 can be used to generate multiple schedules to automatically control energy use at a site as needed or desired.

[00228] According to an aspect, portions or all of EMUI 1000 can be provided as a hosted application that can allow a user to access site reports, historical consumption data, real-time consumption data, operating status of energy consuming devices, control interface to control energy consuming devices, a scheduling interface to schedule utilization and consumption of energy, an inventory tool that will show real-time and historic energy consumption of each energy consumption device within the home, or any combination thereof.

[00229] According to a further aspect, portions of all of EMUI 1000 can include a user interface that can report a current operating condition, and can further include control logic capable of providing a user access to a smart appliance or control system at a site. For example, if a demand response condition may be detected within an energy transmission system, EMUI 1000 can be used to output the condition to a user. A user can then alter an operating status of one or more energy consuming devices at a site.

[00230] According to another aspect, a site can include multiple users that can access and control settings at a site using EMUI 1000. Additionally, a site can include multiple thermostats that can be managed remotely and controlled by a user. For example, a thermostat in the upper portion of a home can be displayed via a web browser or application on an mobile device such as a Blackberry®, I-Phone®, Android®, I-Pad® and the like. A user can select a thermostat using thermostat selector 1004, and adjust the thermostat to a first setting. In some forms, the thermostat settings may have a different effect on the actual temperature within various portions of the home. As such, a user may want to select the desired temperature within at a site, and EMUI 1000 can be used to calculate thermostat settings to achieve the desired temperature. In another form, EMUI 1000 can be used with an energy management system such as energy management system 600 in FIG. 6, or other systems. A thermal response of a zone, room, site, or any portion thereof can be determined and setting of one or more thermostats can be automatically determined to achieve a desired temperature.

[00231] In other forms, EMUI 1000 can be used in association with various types of EMI data. For example, various EMI data such as current and forecasted weather data, grid conditions, real-time pricing data, grid congestions conditions, forecasted demand, or any combination thereof of EMI data can be used to determine a setting recommendation that a user can select. In this manner, a user's lifestyle and preferences can be aligned with the real-time and forecasted conditions allowing a user to make informed energy consumption decisions.

[00232] FIG. 11 illustrates a diagram of a network device, illustrated generally as wireless thermostat 1100, according to an aspect of the disclosure. Wireless thermostat 1100 can be used in association with an energy management system, mobile device, energy management user interface, or various other devices, systems, or any combination thereof.

[00233] Wireless thermostat 1100 can include a outside temperature display 1102, a weather forecast display 1104, and an inside temperature display 1106. Wireless thermostat 1100 can also include a thermostat setting display 1108, a temperature increase input 1110, and a temperature decrease input 1112. Various type of display technology having single color, multicolor, or any combination thereof can be used with wireless thermostat 1100, including, but not limited to LED displays, TFT displays, OLED displays, LCD displays, flexible lighting displays, or any combination thereof.

[00234] According to an aspect, wireless thermostat 1100 can also include a mode switch 1114 and indicators 1116 configured to identify a mode. For example, mode switch 1114 can be placed off, heat mode, air condition model, or fan mode. An associated indicator above each mode within setting display 1116 can be illuminated in connection with an operating mode setting. In other forms, indicators 1116 can be placed behind an associated text and illuminated to indicate a current mode. For example, wireless thermostat 1100 can include a thin material that can allow a backlight, such as LED lighting to illuminate and show text. In another form, mode switch 1114 can include a push button or toggle switch to enable a back light to display and select a mode. Various other input and display methods or combinations thereof can be used.

[00235] According to a further aspect, wireless thermostat 1100 can also include a smart thermostat settings 1118. Smart thermostat settings 1118 can be programmable settings that can display a proximity mode 1122, a vacation mode 1124, and a smart energy mode 1126. Smart thermostat settings 1118 can be displayed based on a capability of a site, a current operating mode of wireless thermostat 1100, a setting within a energy management user interface such as EMUI 1100 and the like, an operating mode of a mobile device, a location of a mobile device, an operating mode of another network device accessible to an energy network, or various other combinations of operating modes or settings accessible to wireless thermostat 1118. For example, a user may want to activate proximity detection to control wireless thermostat 1100 (and possible other network

devices) using proximity mode 1122. As such, a user can activate proximity mode accordingly. In other forms, a user may be going on vacation and can activate vacation mode 1122. In another form, a user may activate a smart energy mode 1126, and an energy schedule provided by EMUI 1100, associated settings, and the like can be deployed.

[00236] According to another aspect, wireless thermostat 1100 can include a housing 1130 can having a material that can detect when a user touches wireless thermostat 1100. For example, housing 1130 can be operably coupled to a heat sensor, capacitive sensor, and the like configured to detect when a user touches a portion of housing 1130. Upon detecting a user contacting housing 1130, one or more displays or indicators of wireless thermostat 1100 may illuminate. In this manner, energy consumed by wireless thermostat 1100 can be realized by changing one or more displays from a sleep state to a display state. According to a further aspect, a portion or all of housing 1130 can include a material such as a concealing material that can include characteristics such as transparency, translucency, semi-transparency, semi-translucency, opaqueness, other types of light altering material, or any combination thereof capable of hiding one or more displays or indicators of wireless thermostat 1100. For example, a backlight or LED can illuminate at a surface of wireless thermostat 1100 giving an appearance of having the display at or near a front surface of housing 1130. As such, housing 1130 with a concealing material can be mounted on a wall or other location without having readings or settings persistently being displayed using a display or other indicators.

[00237] According to an aspect, temperature control mechanisms 1110 and 1112 can include a mechanism (not expressly illustrated in FIG. 11) that can allow housing 1130 to rock or shift left and right as a user contacts mechanisms 1110 or 1112. Other orientations can also be used. For example, wireless thermostat 1100 can mounted to a wall surface (not expressly illustrated in FIG. 11), and a user can contact a temperature increase mechanism 1110. Housing 1130 would rock slightly to the right. In another

form, at least a portion of housing 1130 can include a switch mechanism similar to a mouse of a computer system that provides a clicking sound or a mechanical feedback when temperature control mechanisms 1110 or 1112 are engaged or touched. As such, a user can realize a visual change of display 1108, and can further be provided a mechanical feedback of a switching mechanism upon activation of a switching mechanism. Various other orientations to rotate housing (e.g. up/down, left/right, etc.) can be realized as needed or desired.

[00238] FIG. 12 illustrates a block diagram of a network device, illustrated generally as a wireless thermostat 1200, according to another aspect of the disclosure. Wireless thermostat 1200 be used with wireless thermostat 1100 illustrated in FIG. 11 above or various other devices, systems, or any combination thereof described herein. Wireless thermostat 1200 can include a temperature and humidity sensors 1202, and one or more I/O devices 1204 to allow a user to provide an input to wireless thermostat 1200. For example, I/O device 1204 can enable a user can to select a mode (e.g. off, A/C, Heat, Fan, etc.), a smart energy mode (e.g. proximity, vacation, smart schedule, etc.), or various other features or combinations of features. Wireless thermostat 1200 can also include a power interface 1206, and a bus interface 1208. Wireless thermostat 1200 can also include a processor or controller 1210, and one or more control relays 1212 to control a remote unit such as an HVAC unit, heat pump, other appliances, or any combination thereof.

[00239] According to a further aspect, wireless thermostat 1200 can also include a one or more wireless devices 1214 capable of communicating with one or more associated wireless networks, a memory 1216, and a display interface 1218. Display interface 1218 can be configured to engage one or more LCD displays, touch screens, one or more LEDs, or various other display technologies illustrated generally as display 1222. Wireless thermostat 1200 can also include a precision measurement unit (PMU) 1220 configured to measure consumed by an associated network device, and a profile module 1224 that can

include network protocol configuration data, user profile data, device data, seasonal profile data, or various other types of data that can be accessed during use of wireless thermostat 1200. According to an aspect, wireless thermostat 1200 is a non-programmable thermostat that does not include an enabled programmable thermostat scheduling feature accessible by a user engaging wireless thermostat 1200. As such, a limited amount of scheduling functionality is needed or desired within wireless thermostat 1200 and a user can use a scheduling tool such as EMUI 1000 or various other features provided herein to enable and disable use of wireless thermostat 1200.

[00240] FIG. 13 includes a block diagram of an energy management system, illustrated generally at 1300, according to a further aspect of the disclosure. Energy management system 1300 can be deployed at residential site 1302 and can include an energy management apparatus or controller 1302. Controller 1302 can include portions or all of controller 400 described in FIG. 4 or any other type of system, device, apparatus, or any combination thereof capable of deploying controller 1302.

[00241] According to an aspect, controller 1302 can include an application program interface 1306 operably coupled to a processor or logic (not expressly illustrated in FIG. 13) of controller 1302. Controller 1302 can include a communication interface 1306 a wireless device 1308 configured to access a first network 1314, a wireless device 1310 configured to access a second network 1318, and a wireless device 1312 configured to access a third network 1322. Controller 1302 can also include a network device 1330 such as an Ethernet or other wireline communication device capable of access an information network such as a LAN, WAN, the Internet, and the like.

[00242] According to a further aspect, first network 1314 can be communicatively coupled to a smart meter / AMI device 1316. According to another aspect, second network 1318 can be communicatively coupled to a wireless thermostat (TSTAT) 1320. According to a further aspect, third network 1322 can be coupled to a mobile device 1324. According to an aspect, mobile device 1324 can include a smart phone device such as a

Blackberry®, I-Phone®, Android ® and the like, a laptop computer system, a Netbook, an iPad®, or any other type of mobile device.

[00243] During use, controller 1302 can be used to communicate information from various networks to a wireless energy network to manage one or more network device connected to a wireless energy network. For example, second network 1318 can be configured as a wireless energy network capable of enabling communication with a network device such as TSTAT 1320. Information can be received from information network 1332, and processed by controller 1302 and output to TSTAT 1320 using API 1306 and communication interface 1306. In other forms, information can be communicated from mobile device 1324 to controller 1302 using third network 1322 that may be different from second network 1318. Controller 1302 can detect information communicated from mobile device 1324 and output information to TSTAT 1320 using second network 1318 to TSTAT 1320. As such, controller 1302 can provide a network bridge to enable information communicated between various different types of networks.

[00244] According to an aspect, controller 1302 can include application program interface 1306 configured to use at least a portion of an incoming message communicated from an information network, an information network, a utility network or any combination thereof. For example, an incoming message can include at least a portion of a user energy management schedule. Controller 1302 can initiate altering use of a resource in response to detecting a portion of the first user energy management schedule. For example, a schedule can include altering a thermostat, lights, smart appliances, etc. Communication interface 1306 can further be operably coupled to application program interface 1306 and configured to communicate information using a wireless device.

[00245] For example, communication interface 1306 can communicate with wireless device 1310 capable of accessing a second network 1318 operable as a wireless energy network. Although illustrated as a single communication interface, communication interface can be provided as multiple communication interfaces, a single communication

interface, as a multi-network communications interface, or any combination thereof. As such, multiple networks can be accessed and communicated with as needed or desired. For example, wireless device 1312 can be configured to communicate using a Wi-Fi enabled communication protocol and wireless device 1310 can be configured to communicate using a Zigbee enabled communication protocol.

[00246] According to an aspect, controller 1302 can include wireless device 1312 configured as a Wi-Fi enabled communication device operably coupled communication interface 1306 and third network 1322 operable as a Wi-Fi network. Application program interface 1306 can be configured to receive an energy management schedule communicated using an incoming message received from third network 1322 as an incoming Wi-Fi message. As such, an energy management schedule or other EMI data can be communicated from a Wi-Fi enabled device, such as mobile device 1324 or other devices. Controller 1302 can then use application program interface 1306 to process the energy management schedule and initiate control actions to a network device accessible to an energy network.

[00247] According to another aspect, controller 1302 can receive a first energy management schedule using a first network, and receive a second energy management schedule using a second network. For example, a first energy schedule can be received using network device 1330 and can include a first user energy schedule data. A second energy schedule can be received using third network 1322 operable as a Wi-Fi network. For example, a user of mobile device 1324 can provide scheduling data, control data, or various other energy management scheduling data. Controller 1302 can then use portions of each schedule as needed or desired, and initiate control actions using second network 1318 operable as a wireless home energy network. For example, second network 1318 can be configured as a Zigbee enabled network. As such, multiple networks having scheduling information can be accessed and scheduling data of multiple users can be used to control network devices accessible to an energy network.

[00248] According to an aspect, controller 1302 can include output control actions that have been received from more than one network to control a network device accessible to an energy network. For example, wireless device 1312 can be configured to receive control action data from third network 1322 operable as a WiFi enabled network. Control action data can be provided in association with a first user schedule using mobile device 1324. Controller 1302 can further receive a second control action data from associated with a second user schedule, such as a utility schedule. Second control action data or a second user energy management schedule can be communicated using first network 1314 configured as an AMI enabled network and smart meter / AMI interface 1316. Controller 1302 can then detect whether to use the second control action prior to the first control action.

[00249] According to another aspect, control action data of multiple user schedules can be communicated using communication interface 1306 provided as multiple communication interfaces. For example, wireless device 1312 can include a communication interface accessible to application program interface 1306. Additionally, wireless device 1310 can include a communication interface accessible to application program interface 1306. As such multiple communication interfaces can be deployed to communicate control action data of one or more user energy management schedule.

[00250] According to a further aspect, application program interface 1306 can be used to initiate use of a first control action of a first user energy management schedule prior to using a first control action of a second user energy management schedule prior to the first user energy management schedule. For example, a second user energy management schedule can include one or more control action that can have a higher priority than a first user energy management schedule. As such, controller 1302 and application program interface 1306 can initiate a control action as needed or desired based on a priority.

[00251] According to a further aspect, controller 1302 can initiate a control action or energy management schedule in response to a distance an associated mobile device 1324 may be from site 1304. For example, a first user energy management schedule may be deployed as a first user having mobile device 1324 may be located at or near site 1302. As mobile device 1324 moves away from site 1302 (e.g. one mile, three miles, etc.), a second user energy management schedule can be initiated and used by controller 1302. In this manner, proximity detection of mobile device 1324 can be used to initiate a second user energy schedule.

[00252] According to another aspect, mobile device 1324 can output scheduling data, control action data, energy management data, and the like using third network 1322 configured as a WIFI enabled network. For example, mobile device 1324 can include a application or scheduling logic capable of initiating a user energy management schedule. Mobile device 1324 can encode or output control action data, and communicate the control action data, scheduling data, and the like using a WIFI protocol and messaging format.

[00253] According to an aspect, controller 1302 can include detect when mobile device 1324 may be connected to third network 1322 and modify operation of a network device accessible to controller 1302. For example, mobile device 1324 can be coupled to third network 1322 operable as a WIFI network, or other network capable of being deployed at site 1304. As mobile device 1324 moves away from site 1304 and a network connection to third network 1322 may be altered, controller 1302 can detect a change in connectivity (e.g. weak signal, signal is lost, connection switches to another hub, station, controller, and the like) to third network 1322. a connection status of wireless device 1312 can be output to communication interface 1306 and accessed by application program interface 1306. As such, controller 1302 can detect whether to alter use of a resource or network device accessible to controller 1302. For example, mobile device 1324 may be connected to third network 1322 using a WIFI connection. As a WIFI connection is

altered, controller 1302 can initiate altering an operating condition of a resources such as TSTAT 1320, one or more wireless devices 1308, 1310, 1312, or various other resources accessible to controller 1302. For example, if a second user may be located at site 1304, a second user energy management schedule that may be different from the first user energy management schedule can be deployed. For example, a first portion of a second energy management schedule of a second user can be enabled in response to the operating status of the resource,

[00254] According to another aspect, wireless device 1312 that may have been configured to be coupled to third network 1322 can be placed in a reduced operating condition to save power consumed by controller 1302. In another form, proximity detection of mobile device 1324 can be initiated to detect a location of mobile device 1324 when a WIFI connection or other connection is altered. Additionally, mobile device 1324 may also alter an operating condition by disabling a WIFI connection to third network 1322. Mobile device 1324 can also initiate location reporting of mobile device 1324, and controller 1302 can alter an operating condition of a network device or resource in response to mobile device 1324 being at a distance from site 1304.

[00255] According to another aspect, mobile device 1324 may be configured to enable access to TSTAT 1320 using a network connection 1330 that can include one or more wireless communication protocols. For example, a network device such as TSAT 1320 can be coupled to mobile device 1324 using a WIFI connection, Bluetooth connection, or various other forms of wireless communication. Upon connecting to TSTAT 1320, mobile device 1324 can be used to alter an operating condition of TSTAT 1320. As such, mobile device 1324 having energy management capabilities can be used to alter an operating condition of TSTAT 1320, various other network devices at site 1304, or any combination thereof. For example, mobile device 1324 can include an energy management scheduling tool, such as portions or all of EMUT 1000 described in FIG. 10, to provide control inputs and scheduling data directly to TSTAT 1320. As such, controller

1302 may not be available to output control actions (e.g. a network connection may be lost, etc.), or mobile device 1324 may have priority over controller 1302 to provide control inputs or energy managing scheduling information to TSTAT 1320.

[00256] According to a further aspect, TSTAT 1320 can receive an input and communicate status information, operating conditions, control actions, or any combination thereof to a network resource, controller 1302, mobile device 1423, smart meter / AMI 1316, or any other device, system, or apparatus, or any combination thereof. According to an aspect, TSTAT 1302 can detect is a user altered an operating condition (e.g. change mode, altered smart energy settings, etc.) and can communicate an operating status change. In another form, TSTAT 1320 can alter an operating status of another network device in response to an input to TSTAT 1320. For example, a user may place TSTAT 1320 in a vacation operating mode. As such, TSTAT 1320 can output an updated status to another network device, controller 1302, mobile device 1324, or other network devices. For example, a second TSTAT may be located at site 1304 (not expressly illustrated in FIG 13), and placed in a vacation operating mode using a signal output by TSTAT 1320. In other forms, controller 1302, mobile device 1324, or any combination thereof can be used to alter the operating condition of the second TSTAT as needed or desired.

[00257] FIG. 14 illustrates a collaborative demand response system (CDRS), illustrated generally at 1400, according to an aspect of the disclosure. CDRS 1400 can include a server 1402 operably coupled to an information source such as a database 1404. According to a further aspect, server 1402 can include portions or all of server 602 illustrated in FIG. 6, or any other server capable of being deployed with CDRS 1400. According to further aspect, database 1404 can include site data 1406, user profile data 140, performance data 1410, or various other types of EMI data that can be used in association with CDRS 1400 as needed or desired. According to another aspect, CDRS 1400 can also include access to one or more external data source 1412. CDRS 1400 can

also interface with an energy buyer / auction 1414 capable of buying available capacity of CDRS 1400.

[00258] According to a further aspect, CDRS 1402 can include a monitor 1416, a client interface 1418, and a site interface 1420. According to an aspect, client interface 1418 can be coupled to a first mobile device 1422, a second mobile device 1424, a client system 1426, or any combination thereof. For example, client interface 1418 can be configured as a mobile client interface operable to communicate information using a mobile network. In other forms, client interface 1418 can be coupled to a client system 1426 using an information network such as the Internet.

[00259] According to another aspect, CDRS 1402 can include site interface 1420 configured to interface with multiple sites. For example, site interface 1420 can be operably associated with first site 1428 and mobile device 1422. In other forms, site interface 1420 can be operably associated with second site 1430 and mobile device 1424. Site interface 1420 can also be operably associated with third site 1423 and client system 1426. Various other combinations can also be used with CDRS 1400.

[00260] During use, CDRS 1400 can be used to determine a desire by an owner of a site to participate in a demand response event. Server 1402 and monitor 1416 can detect a current or future demand response initiative to be deployed at a specific time. Server 1402 can detect an availability of capacity in a specific region, and initiate an inquiry with a site owner, user, administrator, etc. According to an aspect, a text message, email message or other form of electronic or wireless messaging can be initiated to detect a desire by a user to participate. Server 1402 can access site data 106 associated with a specific site to detect if a user may have a default setting to participate. In other forms, a user may have set a preference to be contacted via email or text message. As such, server 1402 can initiate a message and detect a desire by one or more users to participate.

[00261] According to a further aspect, server 1402 can access performance data of each site elected to participate in a demand response event. For example, historical site data of a site can be stored within database 1404, and performance of a participating site can be determined as performance data 1410. According to an aspect, other EMI data can be accessed from database 1404, external data source 1412, or any combination thereof and used to determine performance of a site. For example, current and future weather conditions can be used to determine performance of a site. Taking weather conditions into consideration, along with a thermal response or characteristic of a site, a capacity to reduce energy can be determined on a site by site basis. The overall or aggregate capacity and desire to participate can be sold to a third party, monetized by an owner of CDRS 1400, or any combination thereof.

[00262] FIG. 15 illustrates a demand scheduling system (DSS), illustrated generally at 1500, according to an aspect of the disclosure. DSS 1500 can include a server 1502 operably coupled to an information source such as a database 1504. According to a further aspect, server 1502 can include portions or all of server 602 illustrated in FIG. 6, or any other server capable of being deployed with DSS 1500. According to an aspect, database 1504 can include site data 1506, site schedule data 1508, performance data 1510, or various other types of EMI data that can be used in association with DSS 1500 as needed or desired. According to another aspect, DSS 1500 can also include access to one or more external data sources 1512. DSS 1500 can also interface with an utility company, COOP, retail energy provider, or various other energy providers, or any combination thereof, using one or more utility schedule interface 1514. According to an aspect, utility scheduling interface 1514 can be a standard interface however in other forms, utility scheduling interface 1514 can include a custom interface configurable to engage an existing energy company's information network, infrastructure, database, or various other components that can be used by an energy provider to access DSS 1500.

[00263] According to a further aspect, DSS 1502 can include an aggregate demand module 1516, a client interface 1518, a site interface 1520, or any combination thereof. According to an aspect, client interface 1518 can be coupled to a first mobile device 1522, a second mobile device 1524, a client system 1526, or any combination thereof. For example, client interface 1518 can be configured as a mobile client interface operable to communicate information using a mobile network. In other forms, client interface 1518 can be coupled to a client system 1526 using an information network such as the Internet.

[00264] According to another aspect, DSS 1502 can include site interface 1520 configured to interface with multiple sites. For example, site interface 1520 can be operably associated with a first site 1528 that can be associated with mobile device 1522. In other forms, site interface 1520 can be operably associated with a second site 1530 and mobile device 1524. Site interface 1520 can also be operably associated with third site 1532 and client system 1526. Various other combinations can also be used with DSS 1502.

[00265] During use, server 1502 can use EMI data to forecast energy use at sites 1528, 1530, and 1532. For example, each site can include site schedule data 1508 stored within database 1504. For example, EMUI 1000 or another scheduling tool can be used to schedule energy use at a site. Site 1508 schedule data can be used to determine what energy use may be on a site-by-site basis. An aggregate demand of a specific region, zip code, substation, grid location, etc. can also be detected. Aggregate demand module 1516 can then detect what an aggregate level of demand and scheduled demand can then be communicated to a utility company as needed or desired. In this manner, scheduling data that may not have been traditionally accessible on a site by site basis can be used to detect energy demand and schedule energy production. For example, residential sites traditionally use non-programmable and programmable thermostats that do not allow for determining schedules on a site by site basis. DSS 1500 can enable access to scheduling data of each residential site to determine an aggregate demand schedule.

[00266] According to an aspect, server 1502 can access performance data of each site to determine scheduled energy demand. For example, historical site data of a site can be stored within database 1504, and performance of a participating site can be determined as performance data 1510. According to an aspect, other EMI data can be accessed from database 1504, external data source 1512, or any combination thereof and used to determine performance of a site. For example, current and future weather conditions can be used to determine performance of a site. Taking weather conditions into consideration, along with a thermal response or characteristic of a site, a capacity to reduce energy can be determined on a site by site basis. The overall or aggregate demand can be used by the owner of DSS 1500 or communicated to a third party on a contractual basis as needed or desired.

[00267] FIG. 16 illustrates a method of managing energy at a site according to an aspect of the disclosure. Portions or all of the method of FIG. 16 can be used with portions or all of the energy management systems, devices, or apparatuses disclosed herein, or any other type of system, controller, device, module, processor, or any combination thereof, operable to employ all, or portions of, the method of FIG. 16. Additionally, the method can be embodied in various types of encoded logic including software, firmware, hardware, or other forms of digital storage mediums, computer readable mediums, or logic, or any combination thereof, operable to provide all, or portions, of the method of FIG. 16.

[00268] The method begins generally at block 1600. At block 1602, an acquisition interval to acquire network device data can be detected. For example, network device data can be acquired using a wireless energy network having one or more network devices accessible to the wireless energy network. For example, a wireless energy network can include various types of wireless networks configured to communicate information to manage energy use of a network devices accessible to the wireless network. For example, a wireless energy network can include one or more of any combination or portion of, IEEE

802.15-based wireless communication, Zigbee communication, INSTEON communication, X10 communication protocol, Z-Wave communication, Bluetooth communication, WiFi communication, IEEE 802.11-based communication, WiMAX communication, IEEE 802.16-based communication, various proprietary wireless communications, or any combination thereof.

[00269] At decision block 1604, the method can detect whether an acquisition interval may be updated. For example, an acquisition interval can be set to a first interval (such as 1 minute, 2 minutes, 10 minutes etc.), and can then be altered to another interval. According to an aspect, an acquisition interval can be altered in response to a distance a mobile device may be from a site. For example, as a user moves away from a site, an acquisition interval can be increased (e.g. changed from 1 minute to 3 minutes). Similarly, as a mobile device move towards a site, an acquisition interval can be decreased (e.g. changed from 3 minutes to 1 minute). Various combinations of intervals can be used as needed or desired. If at decision block 1604 an acquisition interval has been updated, the method can proceed to block 1606 and an updated interval can be obtained. If at decision block 1604 an acquisition interval has not been changed, the method can proceed to block 1608.

[00270] According to an aspect, at block 1608, device data can be acquired. For example, device data can be obtained by sending a request to one or more network devices joined to a wireless energy network. For example, multiple devices can be accessed at an acquisition interval to obtain device data. Device data can be provided in various forms and types of information. According to an aspect, device data can include a device identifier, a network identifier, operation data, security data, various other types of data that can be used to manage energy use, or any combination thereof. According to a further aspect, device data can be formatted based on a wireless communication protocol (e.g. Zigbee, WiFi, WiMax, etc.) being deployed as the wireless energy network.

[00271] According to another aspect, the method can be modified to detect an availability of one or more network devices. For example, a first network device may be accessible to a wireless energy network and may use a first device profile to communicate information using the wireless energy network. Additionally, a second network device may be accessible to the wireless energy network and may use a second device profile that may be different from the first.

[00272] Upon acquiring device data from one or more network devices, the device data can be translated at step 1610. For example, the device data may be formatted using a device profile, communication protocol, or various other formats to communicate device data using a wireless energy network. At block 1610, device data can be translated into another format to use by another system, process, device, etc. other than the wireless energy network. For example, Zigbee formatted data can be translated into XML encoded data. According to another aspect, device data can be translated to a data object, such as a Java object and the like. Various other translations can also be used.

[00273] The method can then proceed to block 1612 and a report interval can be detected. According to an aspect, a report interval can include an interval that may be the same as the acquisition interval, greater than the acquisition interval, or less than the acquisition interval. According to a particular aspect, the report interval can be twice as long as the acquisition interval. As such, exact timing of when to acquire device data can be obviated as at least one data acquisition may be available to generate a report.

[00274] At decision block 1614, if a report interval should not be updated, the method can proceed to block 1618 as described below. If a report interval should be updated, the method can proceed to block 1616 and an updated report interval may be obtained. According to an aspect, a report interval can be provided using a data acquisition interval. For example, a report interval can be updated in association with an acquisition interval being updated. In other forms, a report interval can be provided and

updated without an acquisition interval being updated. Various combinations of updating a report interval, acquisition interval, or any combination thereof can be used. Upon updating a report interval, the method can proceed to block 1618.

[00275] According to an aspect, at block 1618 report data can be generated. For example, report data can include data that can be provided within a site report and can be formatted in various ways. For example, report data can include a XML encoded data, Java objects, textual data or various combinations thereof. According to an aspect, network device data can be converted to a binary representation. For example, to reduce the amount of information to be communicated, a binary representation can include one or more binary bits within a data field that can represent portions or all of the network device data. According to a further aspect, report data can be stored on a device basis until a site report can be generated.

[00276] Upon generating report data, the method can proceed to block 1620 and generates a site report. For example, a site report can include data received from one or more network devices. In another form, site report data can include data from another source, device, network, or any combination thereof capable of providing data that can be used within a site report. For example, a home controller may include a data and time setting based on a current time zone. A network device may not have a current or updated date and time stamp provided with the network device data. As such, a current date and time stamp can be provided with the site report data. In other forms, data obtained from another source (e.g. WIFI network, AMI network, WiMax network, etc.) can be provided within a site report. For example, a site report can include network device data that includes a thermostat or HVAC system being placed in an 'on' condition. Additionally, an AMI network can be accessed to detect a current energy consumption level, rate, price, savings or various other types of information that can be provided using an AMI network. The AMI network data can be combined with the network device data within a site report. As such, subsequent processing of site reports can include additional information that can

be processed into a site report to manage and report energy use at a site. Other types and combinations of EMI data from various network locations can be included within a site report as needed or desired.

[00277] Upon generating a site report, the method can proceed to block 1622 and a network connection can be initiated. For example, a trusted web services approach to making a network connection can be deployed to realize increased network security at a site. For example, a home controller can be used to initiate a network connection using a LAN, broadband network, wireless data network, WiMax network, WiFi network, or various other networks or combinations of networks. A specific network location can be accessed on a secure basis using SSL or other encryption methods. At decision block 1624, if a network may not be available, the method can proceed to block 1626 and store the site report until the network may become available. The method can then proceed to block 1608 as described herein. If at decision block 1624 a network location may be available, the method can proceed to block 1630 and initiates a transfer of a site report. According to an aspect, if multiple site reports are available, the method can initiate a transfer of the multiple site reports.

[00278] Upon initiating transfer of the site reports, the method can proceed to block 1632 and can initiate processing site report data at a network location. For example, a network location can include a server configured to process site report data and store site report data within a database. Additional processing of the data can be realized as needed or desired. For example, server 602 described in FIG. 6 includes several modules that can be used to process site report data.

[00279] Upon initiating processor of site report data, the method can proceed to decision block 1634 to detect if a control action may be available. For example, a control action field or flag associated with a specific site and one or more network devices can be provided within a database or other storage location. In another form, one or more binary values can be used to indicate if control action data be available. If control action may be

available, the method can proceed to block 1636 and a control action can be received. For example, a control action can be communicated during a session and can include one or more actions associated with a network device accessible at a site. According to an aspect, a control action can be encoded based on a profile, (e.g. Zigbee Profile, Smart Energy Profile, Home Automation, etc.). In other forms, a control action can be formatted as XML encoded data, HTML encoded data, proprietary data format, or any combination thereof.

[00280] Upon receiving a control action at block 1636, or if a control action may not be available, the method can proceed to decision block 1638 and detects if an interval should be updated. For example, a acquisition interval, report interval, or any combination thereof can be available. If an interval should be updated, the method can proceed to block 1640 and one or more intervals can be received and updated. According to an aspect, if an interval may be updated, an update flag can be set to indicate a new or updated interval can be used. In other forms, a current interval field can be updated with a new interval value. If at decision block 1638, an interval may not be updated, the method can proceed to decision block 1642 as described below.

[00281] According to an aspect, at decision block 1642 the method can detect if an update may be available. For example, an update can include one or more new or updated profiles that can be used at a site in association with an energy network. In another form, a software or firmware update can be available to update a network device, home controller, or various other systems, apparatuses, methods, devices, or any combination thereof that can be used at a site. If an update may be available, the method can proceed to block 1644 and a method can be received and processed at block 1646 as needed or desired. According to an aspect, an update may be available at another network location. As such, the method can be modified to include an update available flag or data, and another network location can be accessed to receive an update. If at decision block 1642

an update may not be available, the method can proceed to block 1648 as needed or desired.

[00282] According to an aspect, at block 1648, the method can disconnect from a network location and proceed to block 1650. If a control action may have been received, the method can processor the control action data, and proceed to block 1652 to detect a control action within the control action data. According to an aspect, a control action can include various combinations of actions such as obtaining or reading an operating status or value of one or more network device attributes, altering an operating condition of network device, updating an operating schedule of a network device, or various other control actions as needed or desired. In another form, control action data can be stored within a memory and deployed based on a schedule. As such, a period of time (e.g. twelve hours, twenty four hours, etc.) can be stored and deployed in the event of a information network failure at a site.

[00283] Upon detecting control action data, the method can proceed to block 1654 and can process control action data. For example, if control action data should be stored, the method can store control action data and deploy at a later time. In another form, control action data can be processed into a format that can be used to output network device data. For example, control action data can be processed into one or more JAVA objects, XML files, or other formats to include a received control action data of a specific device. According to an aspect, a network device can include a specific profile to access features of a network device. As such, control action data can be processed based on a specific profile.

[00284] Upon processing control action data, the method can proceed to block 1656 and the processed control action data can be generated into network device data. For example, a network may be deployed to provide an energy network at a site. As such, a protocol to communicate device data as network device data can be deployed. In other forms, a communication device can be coupled to a USB port, UART port, SPI port, other

buses, or combinations thereof. As such, control action data can be formatted into a format that can be communicated using a specific bus having a wireless network device or module coupled to a bus. For example, for example, At block 1656 network device data can be formatted to be communicated using a USB bus having Zigbee communication module coupled to the USB bus. In other forms, a network device, such as a wireless WIFI device can be coupled to a UART bus and accessed to output control action data. Upon generating network device data, the method can proceed to block 1658 and the network device data can be output to a communication module that can output the control action data to the network device. The method can then proceed to block 1660, and to block 1602 as needed or desired.

[00285] According to another aspect, the present disclosure and include an installation system and method configured to install a system at a site. For example, FIG. 6 described herein includes controller 626 and thermostat 628 installed at a site 604. Installation can include controller 626 including a serial number (not expressly illustrated in FIG. 6), or other unique identifier. Thermostat 628 can also include a serial number (not expressly illustrated in FIG. 6) or other unique identifier. Upon a user or agent installing controller 626, an identifier of controller 626, thermostat 628, or any combination thereof, can be communicated to server 602 to authenticate site 604 and enable energy management at site 604.

[00286] According to another aspect, an installation can include controller 626 requesting a list of valid identifiers of one or more network devices that can be installed at site 604. For example, controller 626 can receive a list of one or more valid network devices that may be installed at site 604, and can validate one or more installed devices. For example, controller 626 can detect a network device accessible using an energy network deployed at site 604. A network device can communicate an identifier and controller 626 can detect whether the communicated identifier may be within the list communicated by server 602. As such, an agent that may have an inventory of network

devices, controllers, or any combination thereof can install a controller and a network device without having to determine a valid serial number.

[00287] According to a further aspect, an installation can include using a mobile device including installation logic, one or more applications, settings, or any combination thereof. For example, mobile device 632 illustrated in FIG. 6 or other mobile devices or systems can be used to install portions or all of an energy management system at site 604. For example, a user can deploy an energy management application on mobile device 632 and can input a serial number or other identifier to into an energy management application. In this manner, a user may modify network devices installed at site 604 by for example, adding new devices, updating new devices, deleting current devices, receiving software updates using a serial number of an installed device, or various combinations thereof. According to a further aspect, an installation, settings, and the like can include prompting a user to use a GPS location in connection with an installation and site 604. As such, a user need not type in an address and can just select a current location to associate mobile device 632 and site 604.

[00288] According to another aspect, an installation can include using RFID, bar code, network scan, or various other hands-free identification processes. For example, mobile device 632 can include an energy management application that can include an installation or set-up that includes reading a bar code label of controller 626, TSTAT 628, various other network devices, or any combination thereof. For example, a user can scan a barcode that can include a unique identifier of controller 626, TSTAT 628, or any combinations thereof. According to an aspect, a bar code label can be affixed to a portion of a housing (not expressly illustrated in FIG. 6). In other forms, a bar code can be accessed using a display, such as a display of TSTAT 626 or other network devices or systems that can display one or more bar codes (e.g. outputting multiple at a single system, network device, installation sheet or stickers, etc.). Upon a user scanning a bar code label, the installation process can use a network connection, such as WIFI or other wireless data

networks to communicate unique data and authenticate a system. An server, such as server 602 can authenticate the data and activate a user's account. According to an aspect, a user can also set a location using a current GPS location of mobile device 632 at site 604. In this manner, an installation process that can include authenticating or activating software on a mobile device, a home controller, a network device, and a server account can be coordinated in an efficient manner thereby reducing the need to have an installation technician or other third party activate an account. Various combinations of associating devices, systems, controllers, mobile devices, etc. can be used to activate portions or all of an energy network using hands-free RF, optical scanning devices, or any combination thereof. According to a further aspect, an installation can be modified to allow a third party technician install a system and can include scanning one or more bar codes that may be affixed to a network device, controller, etc. In other forms, a third party technician can scan bar code labels or other devices and affix the labels to a device, controller, system, etc. in association with an installation. As such, inventory management can also be maintained in association with installing a controller, network device, system, etc.

[00289] Note that not all of the activities described above in the general description or the examples are required, that a portion of a specific activity may not be required, and that one or more further activities may be performed in addition to those described. Still further, the order in which activities are listed are not necessarily the order in which they are performed.

[00290] The specification and illustrations of the embodiments described herein are intended to provide a general understanding of the structure of the various embodiments. The specification and illustrations are not intended to serve as an exhaustive and comprehensive description of all of the elements and features of apparatus and systems that use the structures or methods described herein. Many other embodiments may be apparent to those of skill in the art upon reviewing the disclosure. Other embodiments may be used and derived from the disclosure, such that a structural substitution, logical

substitution, or another change may be made without departing from the scope of the disclosure. Accordingly, the disclosure is to be regarded as illustrative rather than restrictive.

[00291] Certain features are, for clarity, described herein in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features that are, for brevity, described in the context of a single embodiment, may also be provided separately or in any sub combination. Further, reference to values stated in ranges includes each and every value within that range.

[00292] Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any feature(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature of any or all the claims.

[00293] The above-disclosed subject matter is to be considered illustrative, and not restrictive, and the appended claims are intended to cover any and all such modifications, enhancements, and other embodiments that fall within the scope of the present invention. Thus, to the maximum extent allowed by law, the scope of the present invention is to be determined by the broadest permissible interpretation of the following claims and their equivalents, and shall not be restricted or limited by the foregoing detailed description.

[00294] Although only a few exemplary embodiments have been described in detail above, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of the embodiments of the present disclosure. Accordingly, all such modifications are intended to be included within the scope of the embodiments of the present disclosure as defined in the following claims. In the claims, means-plus-function

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clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents, but also equivalent structures.

WHAT IS CLAIMED IS:

1. An energy management system comprising:

a database configured to store site report data received from a plurality of residential sites using a wireless home energy network at each site, wherein each residential site includes a thermostat accessible to the wireless home energy network;

a processor operably coupled to the database and configured to access the site report data and:

detect a current temperature set-point of the thermostat at a first residential site;

detect a first seasonal profile of the thermostat;

detect a current operating mode of a HVAC system operably coupled to the thermostat; and

determine a thermostat schedule of the thermostat using the first seasonal profile and the current operating mode of the HVAC system.

2. The energy management system of claim 1, wherein:

the processor is further configured to detect a second seasonal profile of the thermostat;

the first seasonal profile includes at least a minimum seasonal setting;

the second seasonal profile includes at least a maximum seasonal setting;

the processor is further configured to initiate generation of a control action report to communicate to the first residential site, wherein the control action report is generated using one or more of:

an updated temperature set-point having a value between the current temperature set-point and the minimum seasonal set-point in response to the current operating mode of the HVAC being in a heating mode;

an updated temperature set-point having a value between the current temperature set-point and the maximum seasonal set-point in response to the current operating mode of the HVAC being in a cooling mode;

an efficiency rating of the first residential site;

an estimated time period to generate an updated temperature reading an updated temperature set-point;

a current energy price; and

a future energy price.

3. The energy management system of claim 1, wherein the processor is further configured to:

detect a distance between a location reporting device and the first residential site;

detect a current zone from a plurality of zones operably associated with the first residential site using the distance; and

initiate generation of a control action report to be communicated to the first residential site using the current zone.

4. The energy management system of claim 3, further comprising the processor configured to:

detect an efficiency rating of the first residential site;

detect an external temperature at the first residential site;

determine a real-time travel time between the location reporting device and the residential site; and

modify a distance range of the plurality of zones using one or more of:

the efficiency rating;

the external temperature; and

the real-time travel time.

5. The energy management system of claim 3, wherein the processor is further configured to:

detect the location reporting device moving away from the first residential site;

detect a percentage change value associated with the current zone;

detect a base set-point of the wireless thermostat of the first residential site;

determine a difference between the base set-point and a minimum seasonal set-point in response to the current operating mode of the HVAC being in a heating mode;

determine a difference between the base set-point and a maximum seasonal set-point in response to the current operating mode of the HVAC being in a cooling mode;

determine an updated thermostat set-point as a percent change based on the determined difference and the current operating mode of the HVAC; and

output the updated thermostat set-point to be used within the control action report.

6. The energy management system of claim 3, wherein the processor is further configured to:

detect the location reporting device moving toward the first residential site;

detect the current zone and a percentage change value associated with the current zone;

determine a difference between the base set-point and a minimum seasonal set-point in response to the current operating mode of the HVAC being in a heating mode;

determine a difference between the base set-point and a maximum seasonal set-point in response to the current operating mode of the HVAC being in a cooling mode; and

determine an updated thermostat set-point as a percent change based on the difference and the current operating mode of the HVAC; and

output the updated thermostat set-point to be used within the control action report.

7. The energy management system of claim 1, wherein the processor is further configured to:

identify a group of residential sites within a specified region;

access thermostat schedules of each of the residential sites within the group;

aggregate scheduling data using the thermostat schedules; and

initiate an outputting of the aggregated scheduling data.

8. The energy management system of claim 1, further comprising a web services enabled scheduling tool configured to provide a user access to schedule energy use at a first residential site using a web based graphical user interface, wherein the scheduling tool includes:

a thermostat selector configurable to enable selection of one or more wireless thermostats located at the first residential site;

an event scheduler operably associated with the thermostat selector and configurable to enable the user to graphically select a utilization schedule of the one or more wireless thermostats;

wherein the utilization schedule includes a time of day and temperature setting capabilities to control the one or more wireless thermostats; and

an energy savings preference selector configured to graphically modify the utilization schedule and display a resulting energy savings.

9. The energy management system of claim 8, wherein the processor is further configured to:

detect a user interaction with the wireless thermostat;

suggest a modification of the utilization schedule to the user during a user access to the scheduling tool; and

modify the utilization schedule to include the suggestion in response to the user validating the modification.

10. The energy management system of claim 8, wherein the scheduling tool further comprises:

a proximity control selector configured to enable and disable proximity control of the first residential site;

a demand response selector configured to enable and disable participation in demand response event; and

an auto update selector configured to enable an automatic update of the utilization schedule in response to a detection of a user interaction with the one or more wireless thermostats.

11. The energy management system of claim 8, further comprising a demand response selector operable to be displayed with the scheduling tool, wherein the demand response selector includes:

an always participate selection configured to always enable a curtailment of the HVAC system at the first residential site in response to a demand response event;

a never participate selection configured to not allow a curtailment of the HVAC system at the first residential site in response to a demand response event; and

a request participation selection configured to initiate a communication to the user to request participation in a demand response event.

12. The energy management system of claim 8, further comprising:

a plurality of energy templates accessible using the scheduling tool, wherein each template includes a predetermined utilization schedule selectable by the user based on a user's scheduling profile;

wherein the predetermined utilization schedule is modifiable by the user with the scheduling tool; and

an energy personality detection module configured to:

detect an interaction of the user with the wireless thermostat;
display of an energy personality indicia in response to the interaction; and
enable the user to display the energy personality indicia within a social network.

13. The energy management system of claim 1, further comprising the processor configured to:

determine a random sample size of residential sites in connection with estimating an energy consumption of a specific region;

accessing a plurality of thermostat schedules within the specified region based on the random sample size; and

output thermostat scheduling data of the plurality of thermostat schedules in connection with forecasting production.

14. The energy management system of claim 1, further comprising the processor configured to:

detect an enabled demand response setting of the first residential site;

detect a demand response event condition; and

enable a curtailment action of a corresponding HVAC system at the first residential site.

15. The energy management system of claim 1, further comprising the processor configured to:

initiate a demand response event request communication to the users of the plurality of residences;

detect a user response level to participate in a demand response event; and

enable a curtailment of a corresponding HVAC system at the residential sites of the users electing to participate in the demand response event.

16. The energy management system of claim 1, further comprising the processor configured to:

identify a group of residences within the plurality of residences;

determine an energy reduction capacity of each of the residences within the group using an efficiency rating of each of the residences within the group; and

estimate an aggregate energy reduction capacity based on the energy reduction capacity of each of the residences within the group.

17. The energy management system of claim 16, further comprising the processor configured to:

initiate an auction process to sell the aggregate energy reduction capacity to a third party;

detect a sale of the aggregate energy reduction capacity in connection with the auction process; and

initiate a curtailment of the HVAC system at each of the residences within the group.

18. The energy management system of claim 1, further comprising a mobile client module configured to be operably coupled to a mobile device associated with the first residential site, wherein the mobile client module is configured to:

receive a site readings request of the first residential site from the first mobile device;

access the database to retrieve site report data of the first residential site;

format the accessed site report data as mobile device data;

output the mobile device data to the first mobile device using a mobile device network;

receive a request from the mobile device to modify a current temperature set-point of the HVAC system at the first residential site;

initiate generation of a control report including an updated temperature set-point input using the mobile device; and

output a confirmation of the updated temperature set-point.

19. The energy management system of claim 18, wherein the mobile client module is further configured to:

enable access to a proximity setting of the first residential site;

detect multiple control zones at the first residential site;

detect a corresponding wireless thermostat of each of the multiple control zones;

output mobile device data to the mobile device indicating a current reading within each zone;

wherein the current reading is acquired from the site data;

enable access to the corresponding wireless thermostat of each zone; and

enable the mobile device control of the corresponding wireless thermostat.

20. The energy management system of claim 18, further comprising the processor further configured to:

detect a manual input condition to the wireless thermostat at the first residential site;

identify a mobile device associated with the first residential site;

initiate a text message indicating the manual input condition; and

enable a user to alter the manual input condition using the mobile device.

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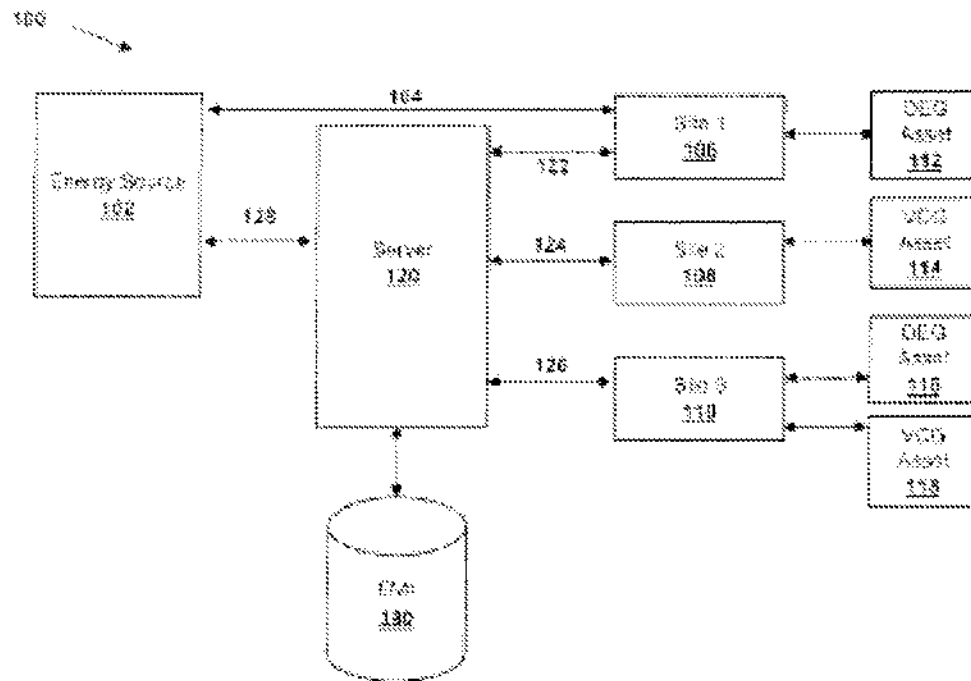
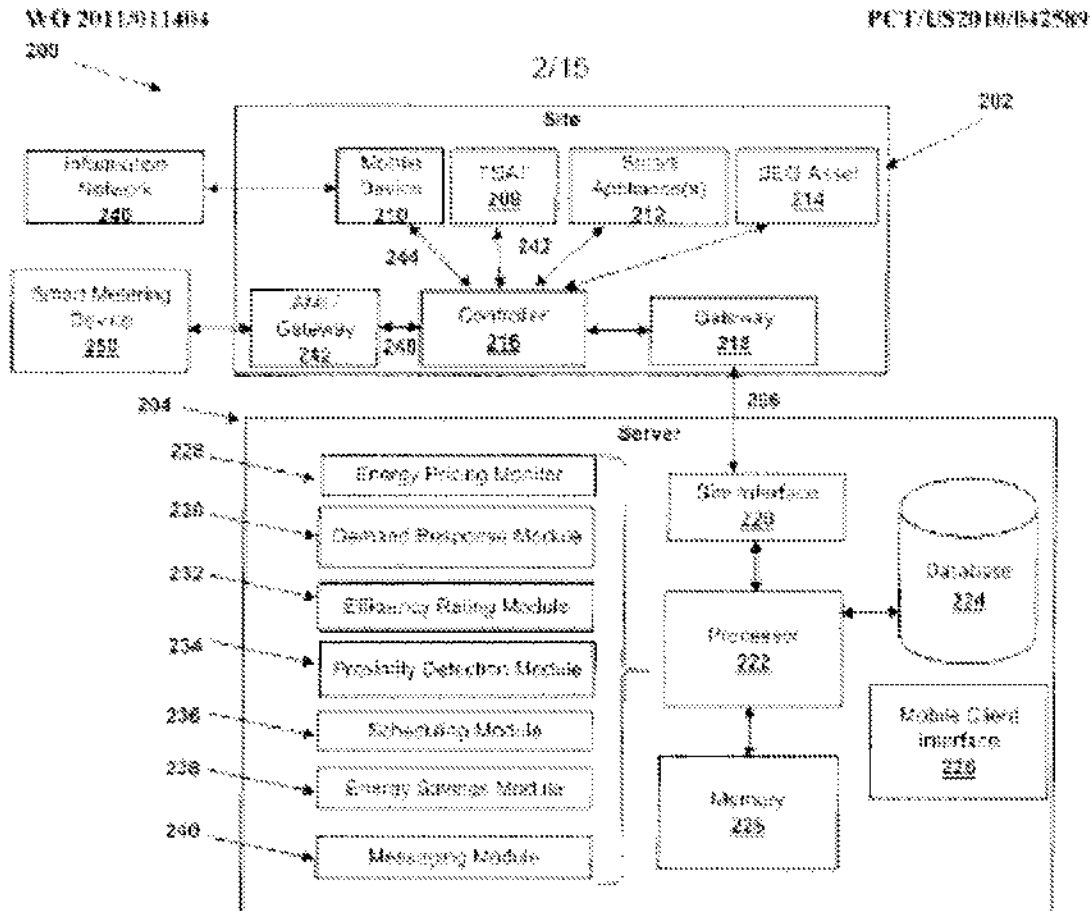


FIG. 1



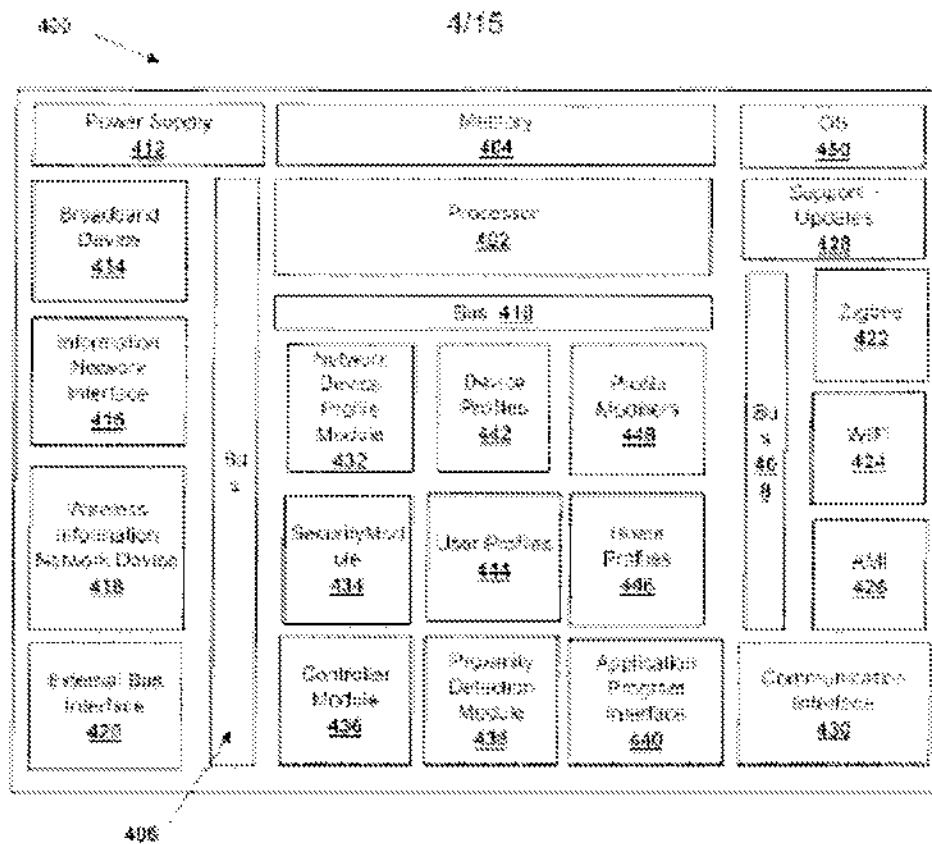


FIG. 4

FIG. 5A

500

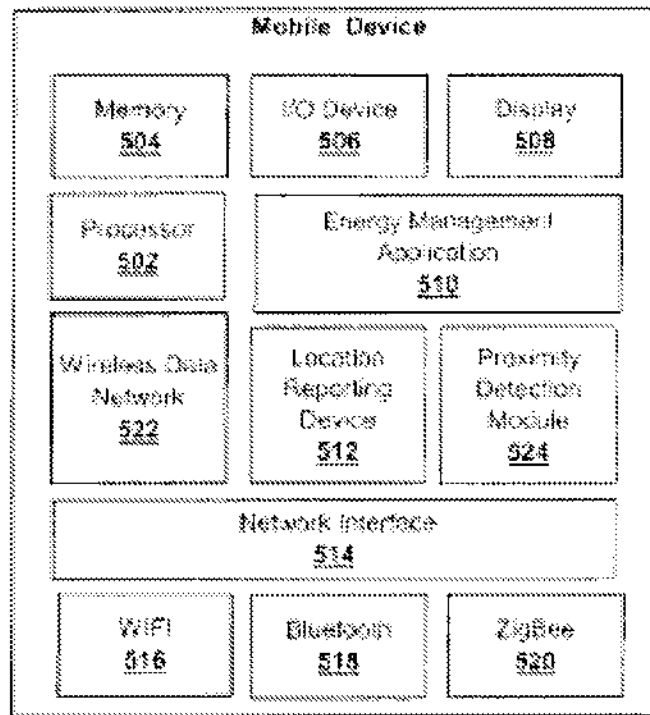


FIG. 5B

530

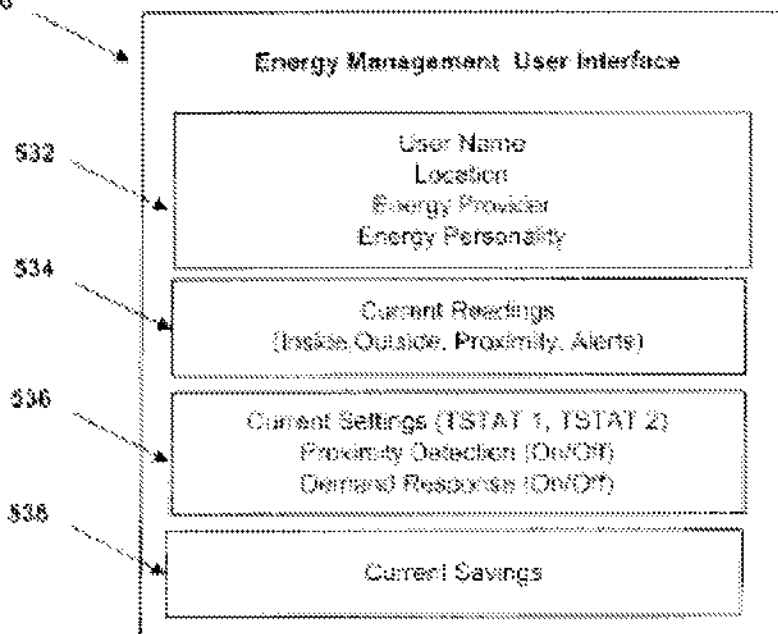
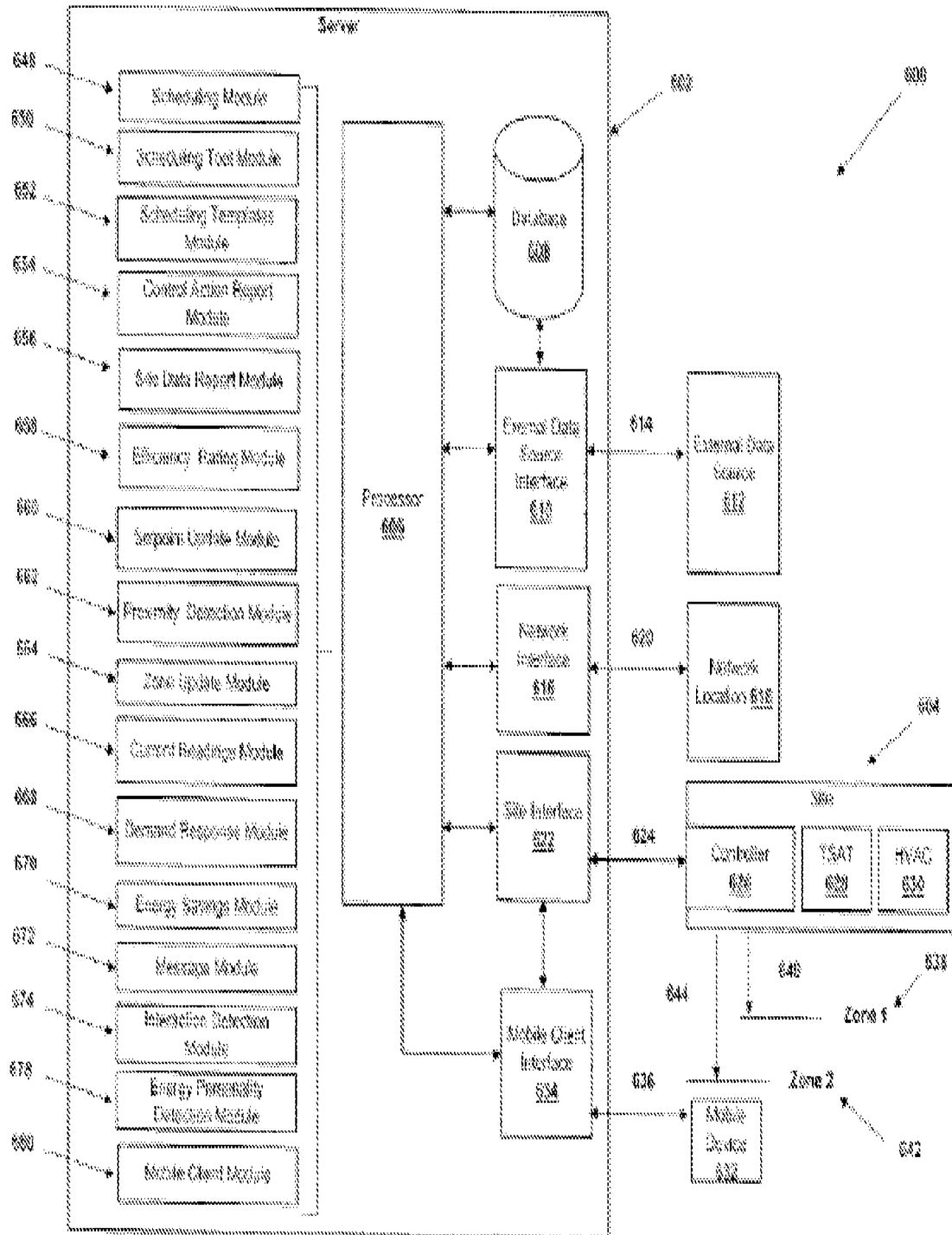


FIG. 6



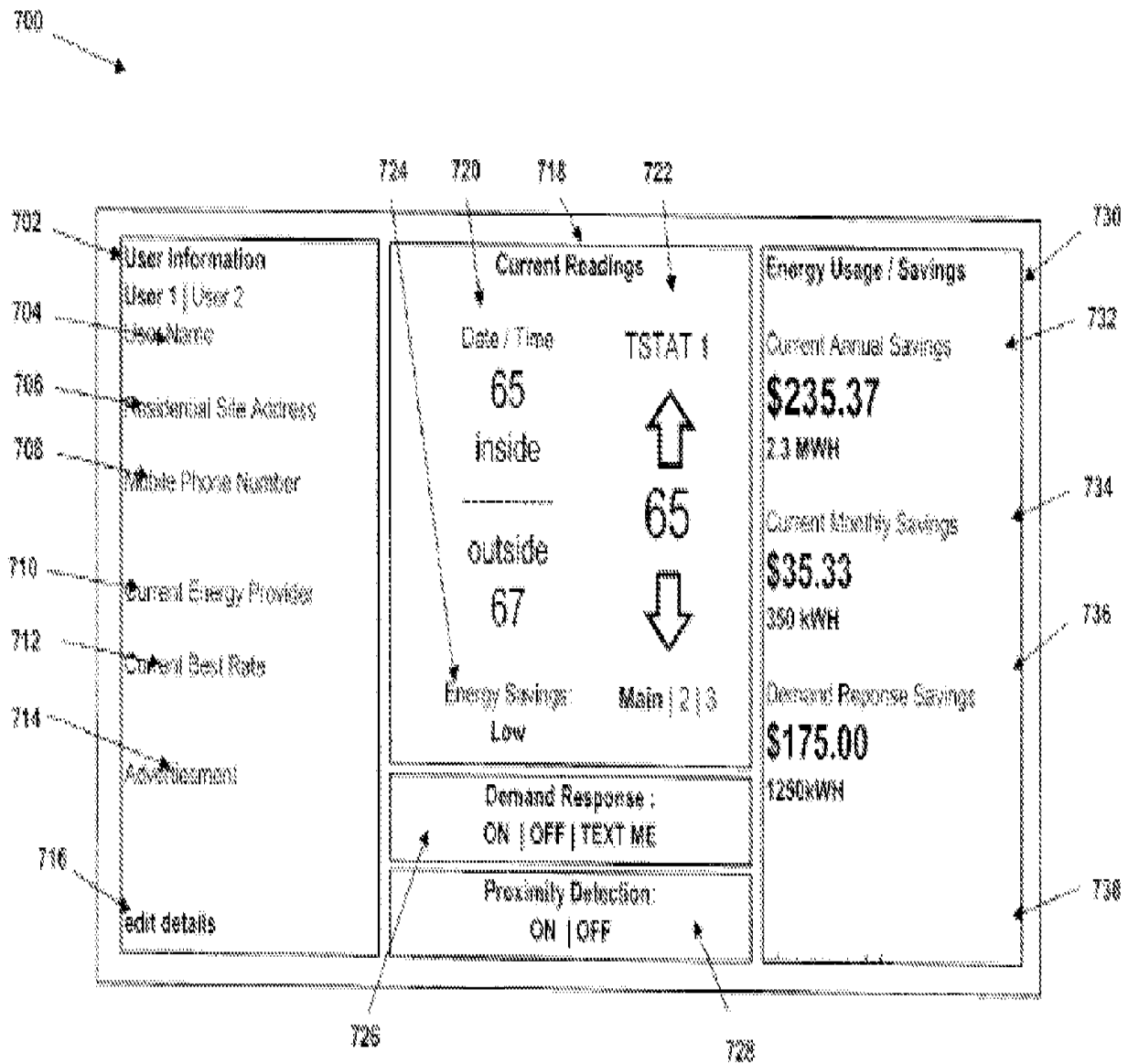


FIG. 7

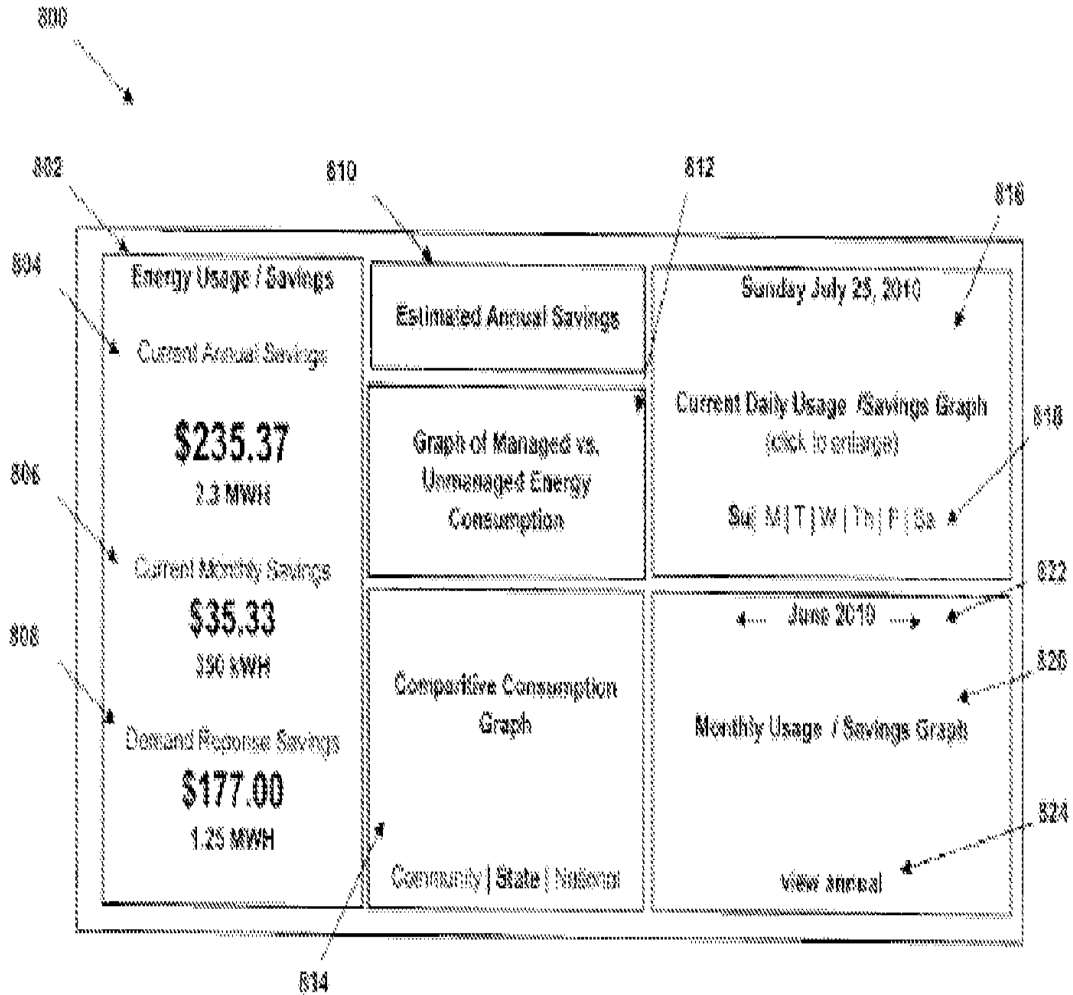


FIG. 8

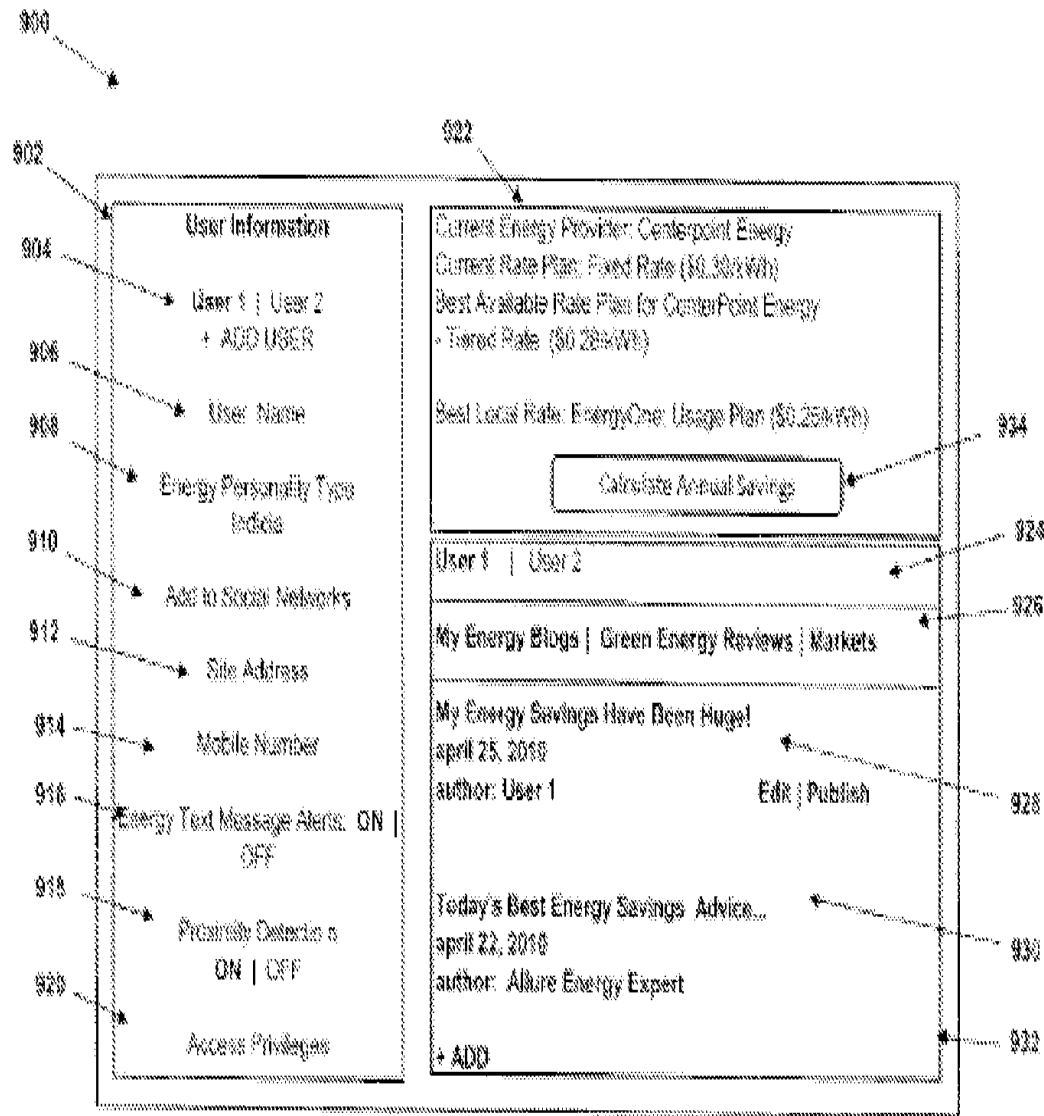


FIG. 9

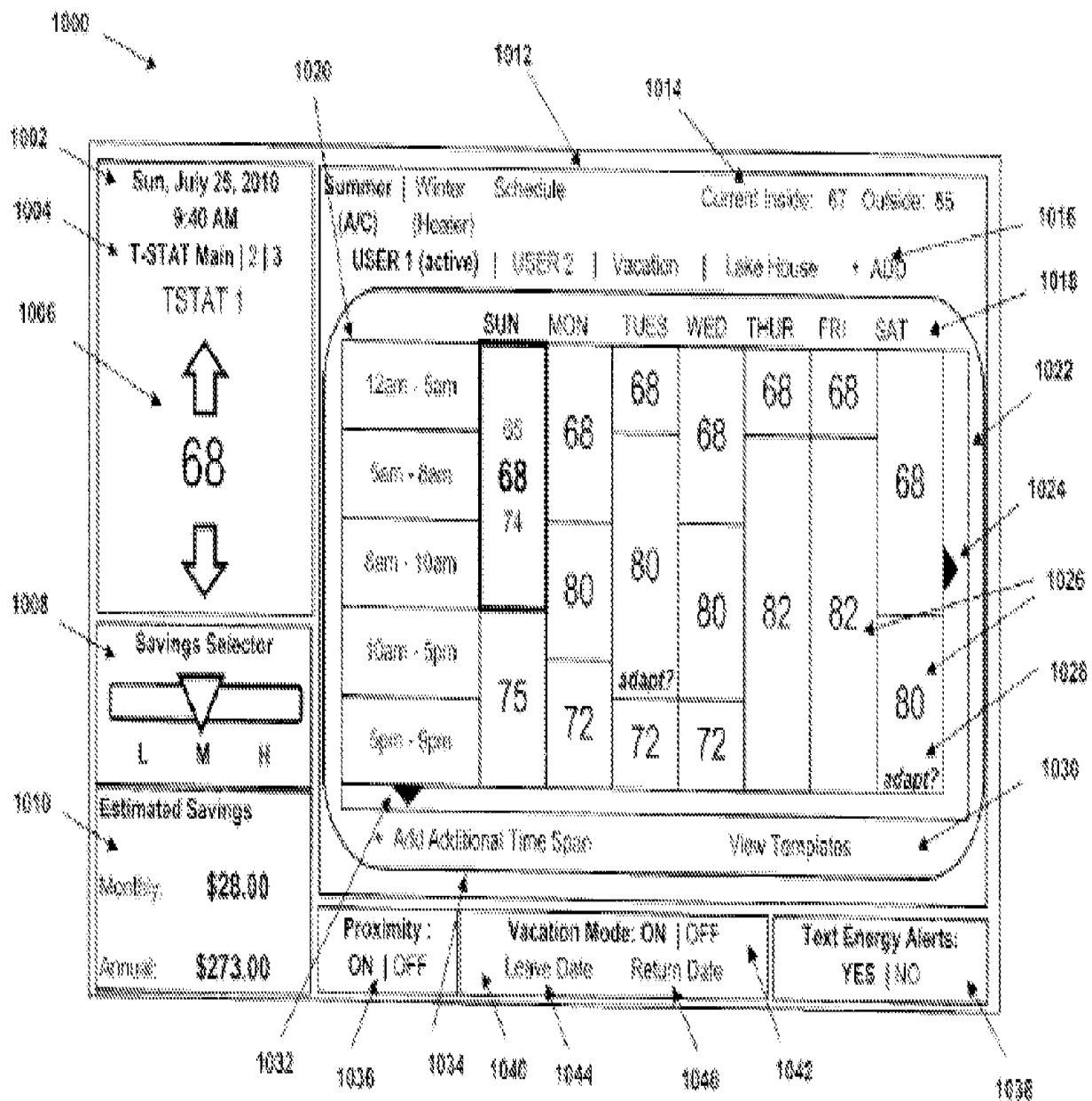


FIG. 10

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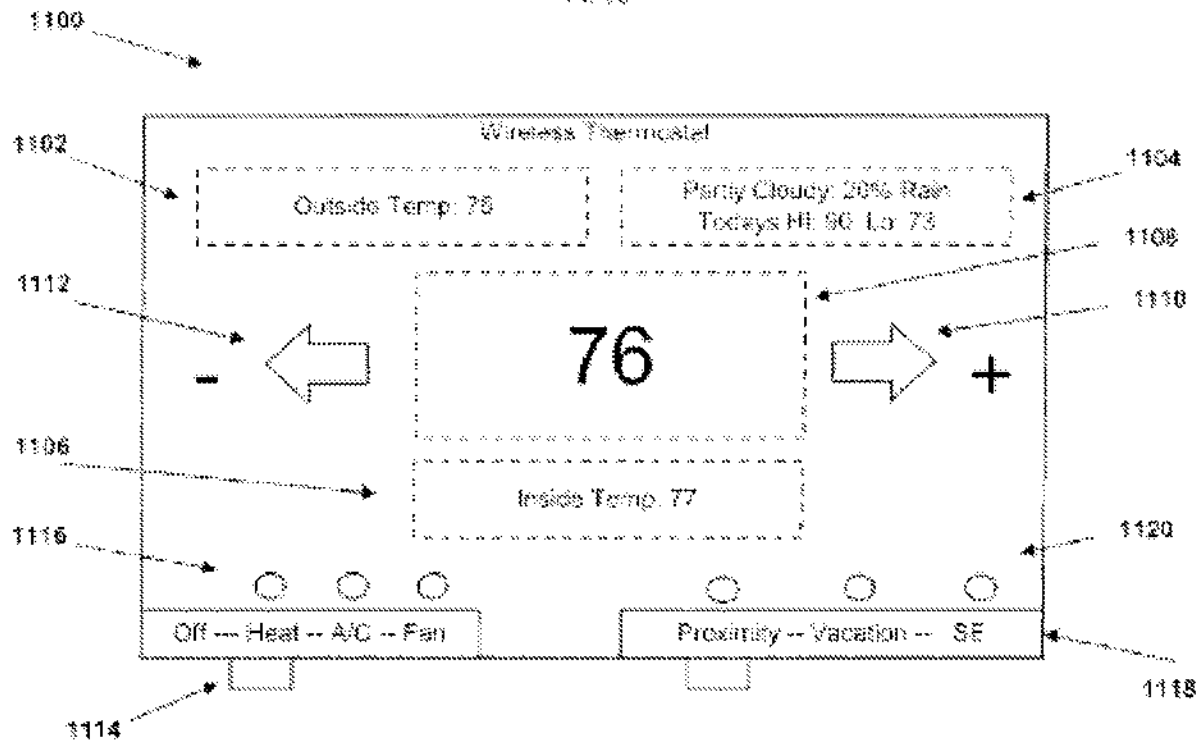


FIG. 11

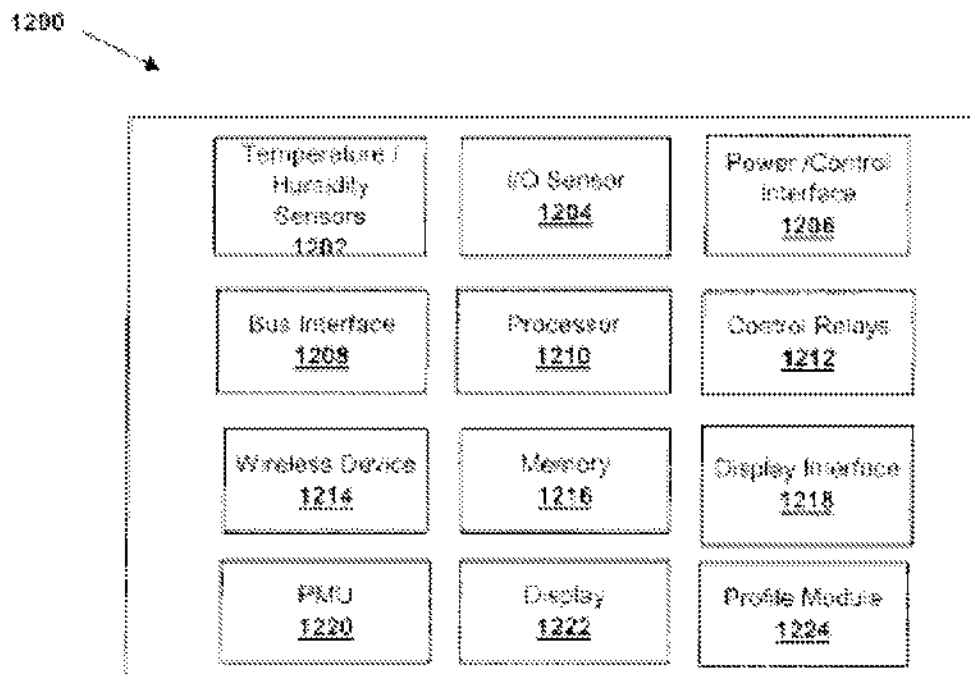


FIG. 12

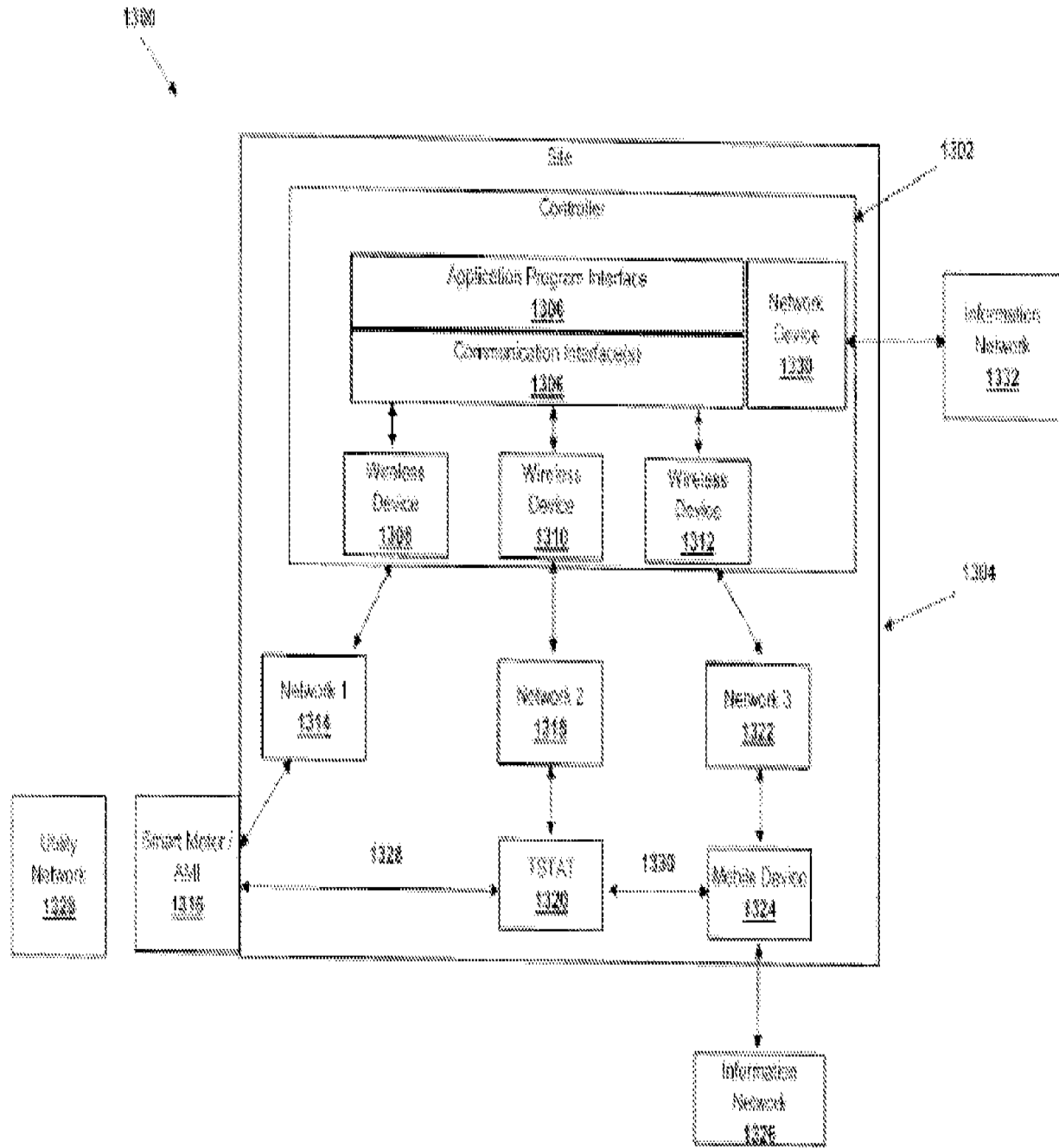


FIG. 13

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PCT/US2010/042589

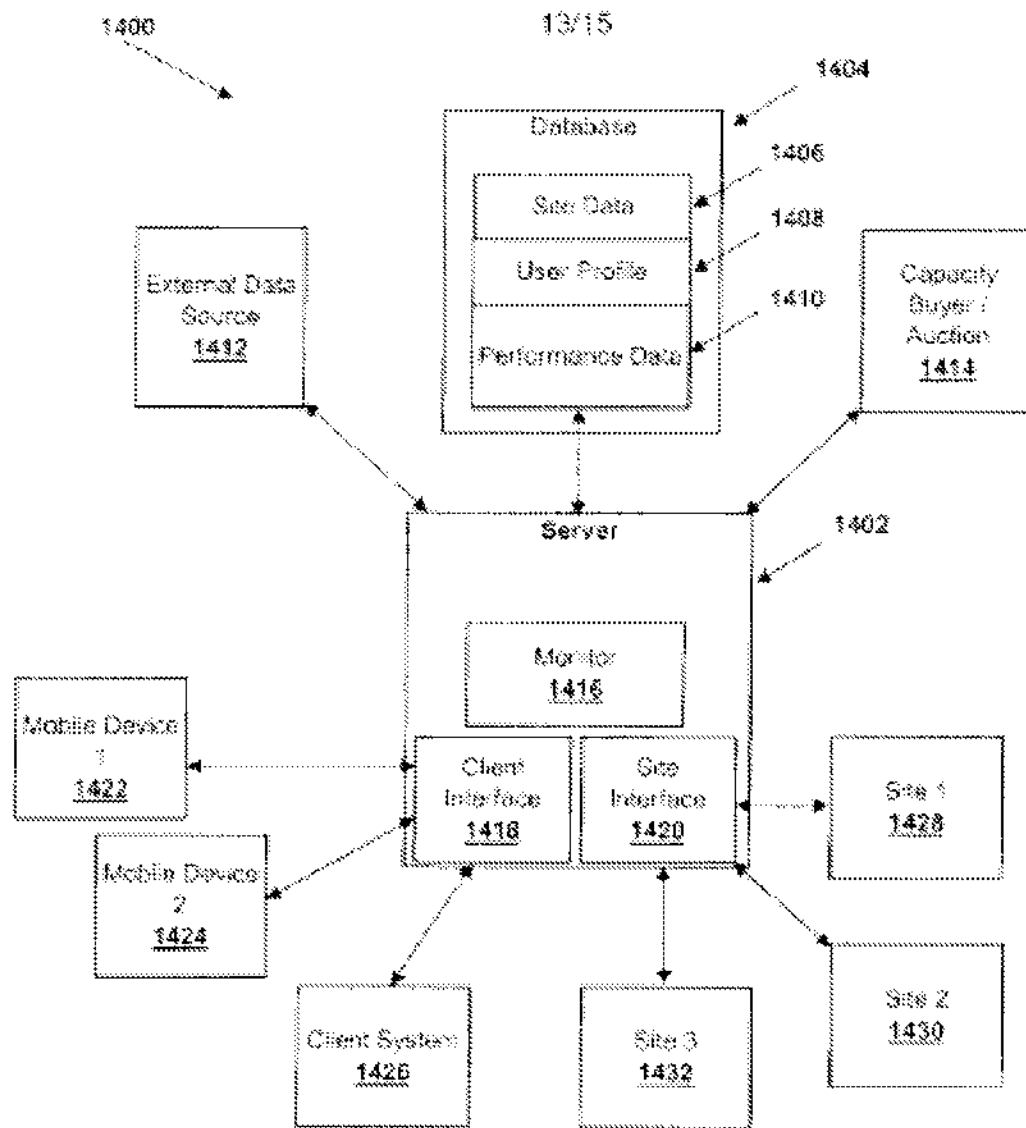


FIG. 14

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PCT/US2018/042589

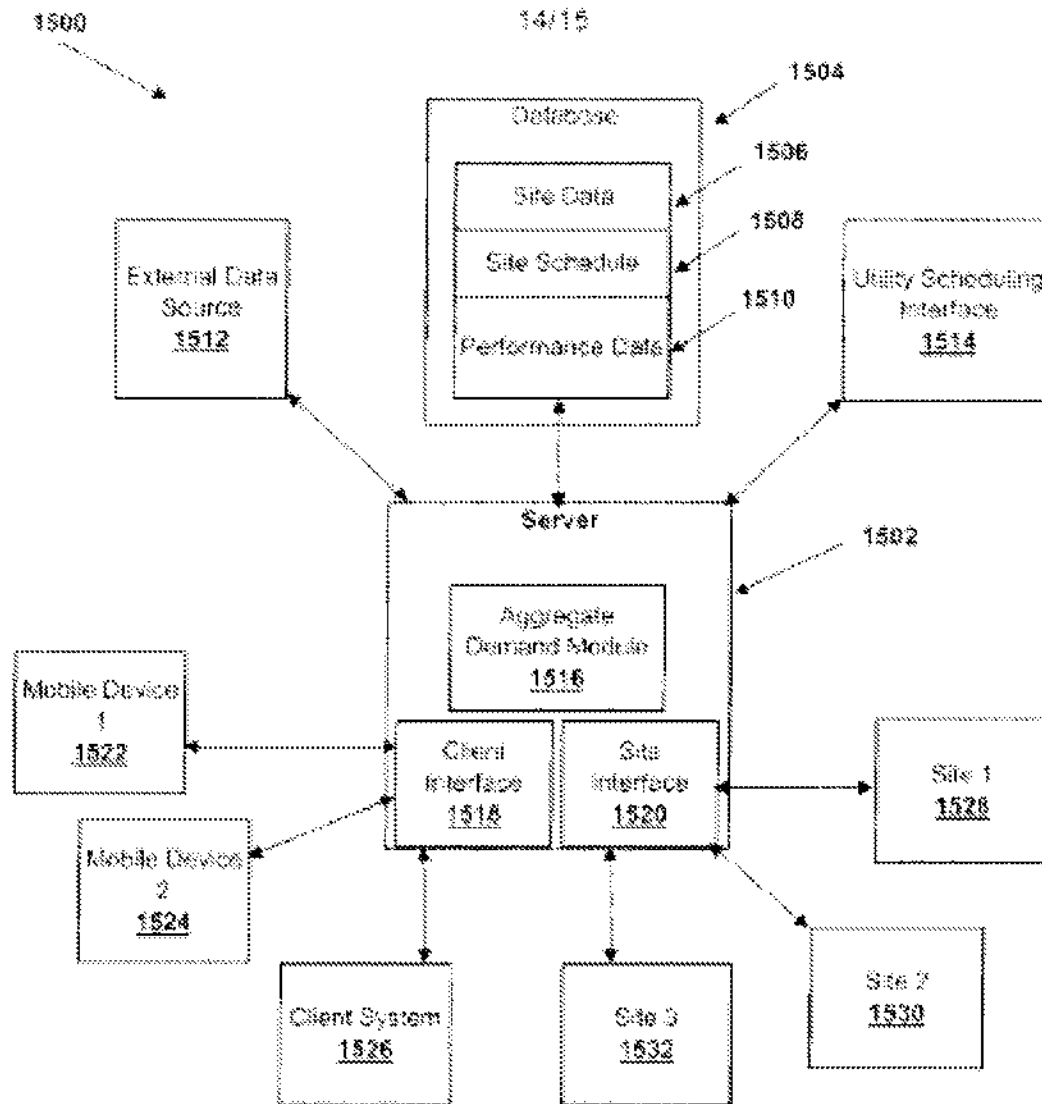
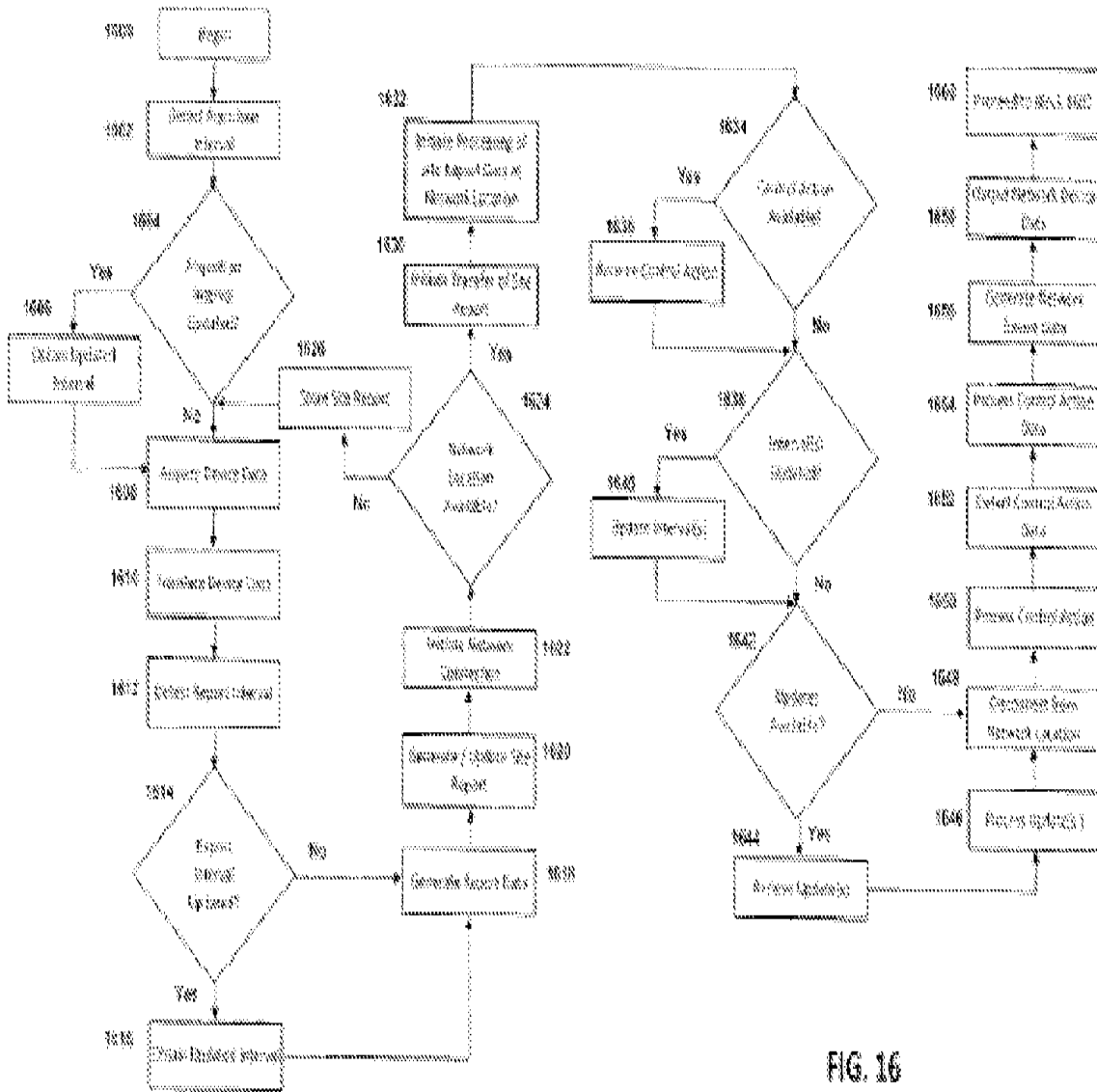


FIG. 15



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/042589

A. CLASSIFICATION OF SUBJECT MATTER

INV. G05D23/19 H02J3/14
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC:

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G05D H02J H04L G05B F24F

Documentation searched other than minimum documentation in the event that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Content of document, with indication where appropriate of the relevant passages	Relevant to claim No.
X	US 2007/043477 A1 (EHLERS GREGORY A [US] ET AL) 22 February 2007 (2007-02-22)	1,2,7-20
Y	paragraphs [0002], [0057] - [0164], [0223] - [0358]; figures 1, 3, 4, 5	3-6
Y	WO 2009/034720 A1 (MITSUBISHI ELECTRIC CORP [JP]) 19 March 2009 (2009-03-19)	3-6
	paragraphs [0038] - [0041]; figure 7 & EP 2 189 803 A1 (MITSUBISHI ELECTRIC CORP [JP]) 26 May 2010 (2010-05-26)	
	paragraphs [0038] - [0041]; figure 7	
X	US 2004/034484 A1 (SOLOMITA MICHAEL V [US] ET AL) 19 February 2004 (2004-02-19)	1
Y	paragraphs [0037] - [0049], [0055],	3-6
A	[0056], [0063]; figures 1,2,6,11	2,7-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex

* Special categories of cited documents

"A" document defining the general state of the art which is not considered to be of particular relevance

"C" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority (claiming or which is cited to establish the publication date of another publication or other special reason (as specified))

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principles or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered to have been conceived or considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

15 November 2010

Date of issuing of the international search report

22/11/2010

Name and mailing address of the ISA/

European Patent Office, P.O. Box 1, Patentstr. 2
NL - 2000 PH The Hague
Tel. (+31-70) 240-0000
Fax. (+31-70) 240-0000

Authorized officer

Vañó Gao, Joaquín

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/042589

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A home energy management system includes a database configured to store site report data received from a plurality of residential sites using a wireless home energy network at each site. Each residential site includes a thermostat accessible to the wireless home energy network. A processor is operably coupled to the database and configured to access the site report data and detect a current temperature set-point of the thermostat at a first residential site; detect a first seasonal profile of the thermostat; detect a current operating mode of a HVAC system operably coupled to the thermostat; and determine a thermostat schedule of the thermostat using the first seasonal profile and the current operating mode of the HVAC system.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/042589

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007043477 A1	22-02-2007	NONE	
WO 2009034720 A1	19-03-2009	CN 101802642 A EP 2189803 A1 US 2010225540 A1	11-08-2010 26-05-2010 09-09-2010
US 2004034484 A1	19-02-2004	NONE	

Electronic Patent Application Fee Transmittal

Application Number:	15002791			
Filing Date:	21-Jan-2016			
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
Total in USD (\$)				120

Electronic Acknowledgement Receipt

EFS ID:	32627641
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Imran Ahmed
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	15-MAY-2018
Filing Date:	21-JAN-2016
Time Stamp:	14:11:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$120
RAM confirmation Number	051618INTEFSW14125000
Deposit Account	111410
Authorized User	Imran Ahmed

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C2_response.pdf	477781	yes	13
			3d61dcedb0f6d09185305d79ac62129469560762		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	13	
Warnings:					
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2		EFACT-011C2_ids.pdf	125966	yes	4
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	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	4	
Warnings:					
Information:					
3	Foreign Reference	EFACT-011C2_REF32.pdf	1124518	no	18
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Case 6:20-cv-00078-ADA Document 60-2 Filed 04/29/21 Page 1113 of 2039

4	Foreign Reference	EFACT-011C2_REF33.pdf	405324 76c26f08c09880c76f0c0095d33c61d0c97727	no	11
Warnings:					
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5	Foreign Reference	EFACT-011C2_REF34.pdf	1631614 d1c9002a72d168c46f3534c60a70c001590c95ac9	no	47
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7	Foreign Reference	EFACT-011C2_REF36.pdf	1097570 ad9cad16cd008c0ca7c56dd922c9cc529cadd6c	no	26
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8	Foreign Reference	EFACT-011C2_REF37.pdf	5353402 532f764f0c5c091cd3c10bc231c0278c5ca62c9	no	138
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9	Non Patent Literature	EFACT-011C2_REF38.pdf	321555 0a2ac82265c8f996c9a1c6c996d7c7c77c3dcf	no	6
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10	Non Patent Literature	EFACT-011C2_REF39.pdf	1046345 c956721c4c0c725acd0072c6d5fa5162f0bdcc3dcf	no	11
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11	Non Patent Literature	EFACT-011C2_REF40.pdf	509679 7c116a92c66d23d3c991c3031072443d886c2d16	no	15
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12	Non Patent Literature	EFACT-011C2_REF41.pdf	159594 191269d95c0cc352c0285c25283658526671dd8	no	3
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13	Non Patent Literature	EFACT-011C2_REF42.pdf	218653 1073c96f3c1c6c90ca25d995c1334c09271cd0a	no	7
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14	Fee Worksheet (SB06)	fee-info.pdf	30547 5c109ca78cf10f6683c5935029f73c0c611363	no	2
Warnings:					
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Total Files Size (in bytes):			13111679		
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PTO/SB/05 (09-11)

Approved for use through 03/31/2014. OARS User: 6002
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Claim Number 15/002,791		Filing Date 01/21/2016		<input type="checkbox"/> To be Mailed	
ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
FOR		NUMBER PAID		NUMBER EXTRA		RATE (\$)		FEE (\$)	
<input type="checkbox"/> BASIC FEE (37 CFR 1.101(a), (b), (c), (d))		N/A		N/A		N/A			
<input type="checkbox"/> SEARCH FEE (37 CFR 1.102(a), (b), (c))		N/A		N/A		N/A			
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.103(a), (b), (c), (d))		N/A		N/A		N/A			
TOTAL CLAIMS (37 CFR 1.101(a))		Total 20 =		+		X \$		=	
INDEPENDENT CLAIMS (37 CFR 1.101(a))		Independent 2 =		+		X \$		=	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.101(a))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(5) and 37 CFR 1.16(a).							
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.101(a))									
* If the difference in column 2 is less than zero, enter "0" in column 2.						TOTAL			
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
05/15/2016		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)	
Total of 19		Minus		= 20		= 0		X \$50 =	
Independent (37 CFR 1.101(a))		Minus		= 3		= 0		X \$200 =	
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(a))									
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(a))									
TOTAL ADDL. FEE						0			
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)	
Total of 19		Minus		=		=		X \$	
Independent (37 CFR 1.101(a))		Minus		=		=		X \$	
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(a))									
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(a))									
TOTAL ADDL. FEE									
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3. ** If the "Highest Number Previously Paid For" in THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 3.									

SLR
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Bibliographic Data

Application No: 15002791

Foreign Priority claimed: ☐ Yes ☒ No35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:

/AJAY OHIA/

Examiner's Signature

Initials

Title:

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS
A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

FILING or 371(e) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/21/2016	700	2824	EF ACT.011C2
RULE			

APPLICANTS

EcoFactor, Inc., Redwood City, CA, UNITED STATES

INVENTORS

John Douglas Steinberg, Millbrae, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 13470074 05/11/2012 PAT 9244470

13470074 is a CON of 12502064 07/13/2009 PAT 8180402

12502064 has PRO of 61134714 07/14/2008

FOREIGN APPLICATIONS**IF REQUIRED, FOREIGN LICENSE GRANTED****

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Search Notes 	Application/Control No. 15/002,791	Applicant(s)/Patent Under Reexamination Steinberg, John Douglas
	Examiner AJAY OJHA	Art Unit 2824

CPC - Searched*		
Symbol	Date	Examiner
F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14	02/13/2018	AO

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor, assignee, classification and text search. See search history.	02/13/2018	AO

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/AJAY OJHA/ Examiner, Art Unit 2824	
--	--

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
SHEET 1 OF 1		Attorney Docket No. EFACT.011C2

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	9,244,470 (EFACT.011C1)	01/26/2016	Steinberg	
	2	9,279,594 (EFACT.008C1)	03/08/2016	Steinberg	
	3	2006/0283965	12/21/2006	Mueller et al.	
	4	2008/0083234	04/10/2008	Krebs et al.	
	5	2016/0061474 (EFACT.010C2)	03/03/2016	Cheung et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
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NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	6	Raji, "Smart Networks for Control", IEEE Spectrum, June 1994.	

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031516

Examiner Signature /AJAY OJHA/ (02/07/2018)	Date Considered 02/07/2018
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	149	((("STEINBERG") near3 ("John"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/02/07 09:39
S2	78	("EcoFactor").AS,AANM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 09:40
S3	46883	(F24F11/006; F24F11/70; F24F11/62; F24F11/30; G05B15/02; G06N7/005; G05D23/1902; F24F11/56; F24F2120/12; F24F2120/10; F24F11/63; F24F11/46; F24F2120/20; F24F2140/60; F24F2120/14).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:02
S4	3	(S1 S2) AND (HVAC AND temperature AND user\$1 AND wireless).CLM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:03
S5	15	("9244470")	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 10:11
S6	9	("9244470")	USPAT	OR	ON	2018/02/07 10:12
S7	25	("20040117330" "20090065596" "20150025691" "6700224" "20130173064" "20040133314" "5348074" "7869907" "8850345" "9057649" "20140316581" "20150120235" "7206670" "20130178985").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 18:05
S8	4	("20080281472" "20090065596")	US-PGPUB; USPAT; USOCR; FPRS; EPO; IBM_TDB	OR	ON	2018/02/07 18:12

EAST Search History (Interference)

<This search history is empty>

2/13/2018 5:48:45 PM**C:\Users\aojha\Documents\EAST\Workspaces\15002791.wsp**

Notice of References CitedApplication/Control No.
15/002,791Applicant(s)/Patent Under
Reexamination
Steinberg, John DouglasExaminer
AJAY OJHAArt Unit
2824

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20090065596-A1	03-2009	Seem, John E.	F24F11/30	236/51
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/002,791	01/21/2016	John Douglas Steinberg	EEACT.011C2	4939
20995	7590	02/16/2018	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			OJHA, AJAY	
2040 MAIN STREET			ART UNIT	PAPER NUMBER
FOURTEENTH FLOOR				
IRVINE, CALIFORNIA 92614			2824	
			NOTIFICATION DATE	DELIVERY MODE
			02/16/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@knobbe.com
 jayna.cartee@knobbe.com

Office Action Summary

Application No.

15/002,791

Applicant(s)

Steinberg, John Douglas

Examiner

AJAY C. JHA

Art Unit

2824

AIA Status

No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status1) ☒ Responsive to communication(s) filed on 01/21/2016☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____2a) ☐ This action is FINAL.2b) ☒ This action is non-final.3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.**Disposition of Claims***5) ☒ Claim(s) 1-18 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.7) ☒ Claim(s) 1-18 is/are rejected.8) ☐ Claim(s) _____ is/are objected to.9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the Patent Prosecution Highway program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers10) ☐ The specification is objected to by the Examiner.11) ☒ The drawing(s) filed on 21 January 2016 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 11912) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).**Certified copies:**a) ☐ All b) ☐ Some** c) ☐ None of the:1) ☐ Certified copies of the priority documents have been received.2) ☐ Certified copies of the priority documents have been received in Application No. _____.3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)1) ☒ Notice of References Cited (PTO-892)3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date _____

2) ☒ Information Disclosure Statement(s) (PTO/SB/309a and/or PTO/SB/309b)4) ☐ Other: _____

Paper No(s)/Mail Date _____

DETAILED ACTION

General Remarks

1. The present application is being examined under the pre-AIA first to invent provisions.
2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.
3. When responding to this office action, applicants are advised to provide the examiner with line numbers and page numbers in the application and/or references cited to assist the examiner in locating appropriate paragraphs.
4. Per MPEP 2111 and 2111.01, the claims are given their broadest reasonable interpretation and the words of the claims are given their plain meaning consistent with the specification without importing claim limitations from the specification.
5. Applicants seeking an interview with the examiner, including **WebEx Video Conferencing**, are encouraged to fill out the online Automated Interview Request (AIR) form (<http://www.uspto.gov/patent/uspto-automated-interview-request-air-form.html>). See MPEP §502.03, §713.01(II) and Interview Practice for additional details.
6. Status of claim(s) *to be treated* in this office action:
 - a. Independent: 1 and 10.
 - b. Pending: 1-18.

IDS

7. Applicant's IDS(s) submitted on 01/21/2016, 03/18/2016 and 01/19/2017

has/have been considered and made of record.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(I)(1) - 706.02(I)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

8. **Claims 1-18 rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 9,244,470 (" '470 Patent").**

Although the claims at issue are not identical, they are not patentably distinct from each other as disclosed in the table below.

Instant Application Claim(s)	'470 Patent Claim(s)
1. A method for varying temperature setpoints for an HVAC system comprising: storing at least a first	1. A method for varying temperature setpoints for a heating ventilation and air conditioning (HVAC) system

HVAC temperature setpoint and at least a second HVAC temperature setpoint; monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure; determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint; prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system; in response to said prompting, receiving input from said one or more users; and keeping said current HVAC temperature setpoint based upon said input from said one or more users.

comprising: storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated with said structure deemed to be occupied; monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; determining a probability that specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by at least one specific occupant of said structure; determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint; determining that said at least one specific occupant has previously indicated a preference that input be obtained before automatically changing said current HVAC temperature setpoint in response to said activity status; prompting said at least one specific occupant based on said determining that said input should be obtained, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system; in response to said prompting, receiving said input from said at least one specific occupant; and keeping said current HVAC

temperature setpoint based upon said input from said at least one specific occupant.

2-9

10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint; at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint, said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure; said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and wherein said application in response to said prompting, receives input from said one or more users; and wherein said

2-9

10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the presence of one or more occupants in said structure; at least one wireless device associated with said one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device; an application comprising one or more computer processors in communication with a storage medium comprising computer accessible memory, the application receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied, said application determining a probability that specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by at least one specific occupant of said structure; said application determining that said at least one specific occupant has previously indicated a preference that input be

current temperature setpoint is set based upon said input from said one or more users.

obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device; **said application prompting said at least one specific occupant based on said determining that said input should be obtained, wherein said application provides electronic notice to said at least one specific occupant of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and wherein said application in response to said prompting, receives said input from said at least one specific occupant; and wherein said current temperature setpoint is set based upon said input from said at least one specific occupant.**

11-18

11-18

This is a non-provisional double patenting rejection.

Claim Rejections - 35 USC § 103

9. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claim(s) 1-18 is/are rejected under AIA 35 U.S.C. 103 as being unpatentable over US 2008/0281472 (hereinafter "Podgorny") in view of Seem et al. US 2009/0065596 (hereinafter "Seem").**

Re: Independent Claim 1, Podgorny discloses a method for varying temperature setpoints for an HVAC system (Podgorny abstract) comprising:

storing at least a first HVAC temperature setpoint (Podgorny ¶¶ [0092] and [0019] "user preferences stored" in occupied/non-occupied) and at least a second HVAC temperature setpoint (Podgorny ¶¶ [0009] and [0019] describe occupancy and non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

monitoring an activity status of at least one wireless device (Podgorny FIG. 2 element 508 wireless device) associated with one or more occupants of said structure (Podgorny ¶ [0083] "detects the presence of the user in the Environmental Zone" which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (Podgorny ¶ [0027] "graphical user interface" and ¶¶ [0067], [0080]), wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (Podgorny ¶ [0083] "keyboard activity monitoring");

determining a probability that the specific activity status of said wireless device (Podgorny ¶ [0093] "identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number" and ¶

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[0005]) is associated with the use of said wireless device by a specific occupant or occupants of said structure (Podgorny abstract "autonomous process control" is automatic and "occupancy sensor that recognizes the presence");

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint (Podgorny ¶ [0021] "maintain the environmental parameters temperature" which examiner interpreted that to maintain temperature it determine HVAC temperature setpoint associated with HVAC system and ¶¶ [0008], [0029]-[0030] and [0063]);

Podgorny fails to disclose:

prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and keeping said current HVAC temperature setpoint based upon said input from said one or more users.

Seem discloses:

prompting said one or more users (Seem ¶ [0062] "user to specify any number of personal comfort settings" which means prompting said one or more users based on said determining that said one or more of said user's input should be obtained and ¶ [0065]), wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system (Seem Figs. 8-9 and ¶ [0065] "prompting by the user interface" which means

prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system);

in response to said prompting, receiving input from said one or more users (Seem ¶ [0065] "process 800 to adjust a building automation system setting" which means in response to said prompting, receiving input from said one or more users); and keeping said current HVAC temperature setpoint based upon said input from said one or more users (Seem Fig. 11 element 1120 "adjust HVAC for normal conditions" which examiner interpreted as current setting based on the input from users and paragraph 0070).

Podgorny and Seem disclose home automation and HVAC control system. Seem discloses message communication to various wireless devices including personal wireless devices. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending wireless messages, as taught by Seem in order to improve control of environmental conditions to reflecting individual preferences, as suggested by Seem (Seem ¶ [0003]).

Re: Independent Claim 10, Podgorny discloses a system for altering the setpoint on a thermostat for space conditioning of a structure (Podgorny Figs. 1 and 22) comprising:

at least one thermostat having at least a first temperature setpoint (Podgorny ¶¶ [0092] and [0019] "user preferences stored" in occupied/non-occupied) and at least a second temperature setpoint (Podgorny ¶¶ [0009] and [0019] describe occupancy and

non-occupancy and ¶ [0092] describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields);

at least one wireless device (Podgorny FIG. 2 element 508 wireless device) associated with one or more occupants of said structure (Podgorny ¶ [0083] "detects the presence of the user in the Environmental Zone" which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (Podgorny ¶ [0027] "graphical user interface" and ¶¶ [0067], [0080]), wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (Podgorny ¶ [0083] "keyboard activity monitoring");

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device (Podgorny ¶ [0059] "status monitoring and data collection") and whether said thermostat is set to said first temperature setpoint (Podgorny ¶ [0089] "occupancy sensor shuts the system down when users are away from their workstations" which means thermostat is set to said first temperature setpoint that indicates said structure is not occupied and ¶¶ [0009] and [0019]), said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device (Podgorny ¶ [0093] "identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number" and Podgorny ¶ [0005]) by a specific occupant or occupants of said structure (Podgorny abstract "autonomous process control" is automatic and "occupancy sensor that recognizes the presence");

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Podgorny fails to disclose:

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

Seem discloses:

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat (Podgorny ¶ [0062] “user to specify any number of personal comfort settings” which means prompting said one or more users based on said determining that said one or more of said user’s input should be obtained and ¶ [0065]) is set to one of said first temperature setpoint or said second temperature setpoint (Podgorny Figs. 8-9 and ¶ [0065] “prompting by the user interface” which means prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system); and

wherein said application in response to said prompting, receives input from said one or more users (Podgorny ¶ [0065] “process 800 to adjust a building automation system setting” which means in response to said prompting, receiving input from said one or more users); and

wherein said current temperature setpoint is set based upon said input from said one or more users (Podgorny Fig. 11 element 1120 "adjust HVAC for normal conditions" which examiner interpreted as current setting based on the input from users and ¶ [0070]).

Podgorny and Seem disclose home automation and HVAC control system. Seem discloses message communication to various wireless devices including personal wireless devices. It would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention, to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending wireless messages, as taught by Seem in order to improve control of environmental conditions to reflecting individual preferences, as suggested by Seem (Seem ¶ [0003]).

Re: Claims 2 and 11, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a remote control (Seem ¶ [0067] "remote control 1006 may be configured to wirelessly communicate" and Fig. 10 which means wireless device is a remote control and ¶ [0043] describes "portable wireless device 306" which is a wireless device and it is a remote control).

Re: Claims 3 and 12, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a wireless phone (Seem ¶ [0043] “cell phone, PDA, or any other device with transmitting capability”, here “cell phone is a wireless phone”, which means wireless device is a wireless phone).

Re: Claims 4 and 13, Podgorny and Seem discloses all the limitations of claims 3 or 12 on which these claims depend. They further disclose:

wherein said wireless phone is connected to a cellular network (Podgorny ¶ [0005] “ wireless converged networks” which means wireless phone is connected to a cellular network).

Re: Claims 5 and 14, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said wireless device is a tablet computer (Seem Figs. 2, 3 and ¶¶ [0029]-[0032], [0043] disclose multiple portable device, e.g. 104 construed as a tablet and 306)

Re: Claims 6 and 15, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server (Seem ¶ [0008] “ server computer further includes a processing circuit for accessing a memory device storing the program code” and “program code for adjusting the building automation” which examiner interpreted that it a remote server and first and second HVAC temperature setpoints are stored in a database associated with the remote server and Fig. 2 element 130 is the “server”).

Re: Claims 7 and 16, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

in which said wireless device communicates with a remote server (Seem ¶ [0032] “140 configured to accept a signal or input from various portable wireless devices” and Fig. 2 shows that wireless devices are communicating with a server, element 130 of Fig. 2 is a “server” and elements 502, 506 and 508 of Fig. 2 are “wireless device”).

Re: Claims 8 and 17, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

further comprising adjusting said current HVAC temperature setpoint with a remote computer (Podgorny abstract, the user controlling “over the internet” at a remote computer and Seem at et. ¶ [0026], [0029] and Fig. 2 describe same limitations).

Re: Claims 9 and 18, Podgorny and Seem discloses all the limitations of claims 1 or 10 on which these claims depend. They further disclose:

in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users (Podgorny abstract “autonomous process control and interaction with system users”, which means first HVAC temperature setpoint is varied automatically (autonomous) based on said input from one or more users).

Application/Control Number: 15/002,791
Art Unit: 2824

Page 15

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJAY OJHA whose telephone number is (571)272-8936. The examiner can normally be reached on M-F, 7:30AM to 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJAY OJHA/
Examiner, Art Unit 2824
ajay.ojha@uspto.gov

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Multiple sheets used when necessary)

SHEET 1 OF 2

Application No	15/002791
Filing Date	January 21, 2016
First Named Inventor	John Douglas Steinberg
Art Unit	3744
Examiner	Unknown
Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,451,879	05/29/1984	Welch et al.	
	2	4,675,828	06/23/1987	Winston	
	3	4,897,798	01/30/1990	Cler	
	4	5,279,458	01/18/1994	Dewolf et al.	
	5	7,590,469	09/15/2009	Grohman	
	6	8,428,782	04/23/2013	Imes	
	7	2004/0065095	04/08/2004	Osborne et al.	
	8	2009/0188985	07/30/2009	Schering et al.	
	9	2012/0186774	07/26/2012	Matsuoka et al.	
	10	2014/0058567	02/27/2014	Matsuoka et al.	
	11	2015/0142180	05/21/2015	Matsuoka et al.	
	12	2016/0091219 (EFACT.007C2)	03/31/2016	Steinberg et al.	
	13	2016/0097557 (EFACT.013C4)	04/07/2016	Steinberg	
	14	2016/0238270	08/18/2016	Steinberg	
	15	2016/0258822	09/08/2016	Steinberg et al.	
	16	2016/0363337	12/15/2016	Steinberg et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
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NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	17	CHENG et al., "Smart Sensors Enable Smart Air Conditioning Control", Sensors 2014, ISSN 1424-8220, June 24, 2014, 25 pages.	
	18	GUNES et al., "Improving Energy Efficiency and Thermal Comfort of Smart Buildings with HVAC Systems in the Presence of Sensor Faults", IEEE, August 24-26, 2015, 6 pages.	
	19	SIMMINI et al., Energy Efficient Control and Fault Detection for HVAC Systems, Univ. of Padova, XXVI Series, 2014, 144 pages.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Multiple sheets used when necessary)

SHEET 2 OF 2

Application No	15/002791
Filing Date	January 21, 2016
First Named Inventor	John Douglas Steinberg
Art Unit	3744
Examiner	Unknown
Attorney Docket No.	EFACT.011C2

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	20	SKLAVOUNOS. "Detection of Abnormal Situations and Energy Efficiency Control in Heating Ventilation and Air Conditioning (HVAC) Systems", Brunel University thesis, September 2015, 151 pages.	
	21	Extended Search Report for European Application No. 13804057.1 dated June 1, 2016 (EFACT.014EP).	

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Examiner Signature /AJAY OJHA/ (02/07/2018)	Date Considered 02/07/2018
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 1 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	H2176	12/05/2008	Meyer et al.	
	2	12/805705	06/10/2010	Crabtree	
	3	13/470074	08/30/2012	Steinberg	
	4	13/523697	06/14/2012	Hublou et al.	
	5	13/725447	06/06/2013	Steinberg	
	6	13/729401	12/28/2012	Sloop	
	7	13/852577	03/28/2013	Steinberg et al.	
	8	13/858710	09/05/2013	Steinberg et al.	
	9	13/861189	04/11/2013	Steinberg et al.	
	10	14/082,675 (EFACT.007C1)	11/18/2003	Steinberg et al.	
	11	14/283,762	04/28/2014	Steinberg	
	12	14/285,384	05/22/2014	Steinberg, et al.	
	13	14/292,377	05/30/2014	Steinberg	
	14	14/491,554	09/19/2014	Steinberg	
	15	14/527,433	10/29/2014	Steinberg, et al.	
	16	14/731,221	08/04/2015	Steinberg, et al.	
	17	D 646,990	10/18/2011	Rhodes	
	18	D 659,560	05/16/2012	Rhodes	
	19	D 673,467	01/01/2013	Lee et al.	
	20	D 706,096 (EFACT.015DA)	05/20/2014	Steinberg et al.	
	21	4,136,732	01/30/1979	Demaray et al.	
	22	4,341,345	07/27/1982	Hammer et al.	
	23	4,403,644	09/13/1983	Hebert	
	24	4,475,685	10/09/1984	Grimado et al.	
	25	4,655,279	04/07/1987	Harmon	
	26	4,674,027	06/16/1987	Beckey	
	27	5,124,502	06/23/1992	Nelson et al.	
	28	5,244,146	09/14/1993	Jefferson et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)		Examiner
SHEET 2 OF 10		Attorney Docket No. REACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (If known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	5,270,952	12/14/1993	Adams et al.	
	30	5,314,004	05/24/1994	Strand et al.	
	31	5,348,078	09/20/1994	Dushane et al.	
	32	5,462,225	10/31/1995	Massara et al.	
	33	5,544,036	08/06/1996	Brown et al.	
	34	5,555,927	09/17/1996	Shah	
	35	5,572,438	11/05/1996	Ehlors et al.	
	36	5,682,949	11/04/1997	Ratcliffe et al.	
	37	5,717,609	02/10/1998	Packa et al.	
	38	5,725,148	03/10/1998	Hartman	
	39	5,729,474	03/17/1998	Hildebrand et al.	
	40	5,818,347	10/06/1998	Dolan et al.	
	41	5,977,864	11/02/1999	Williams et al.	
	42	6,079,626	06/27/2000	Hartman	
	43	6,115,713	09/05/2000	Pascucci et al.	
	44	6,145,751	11/14/2000	Ahmed	
	45	6,178,382	01/23/2001	Woolard et al.	
	46	6,260,765	07/17/2001	Natale et al.	
	47	6,241,156	06/05/2001	Kline et al.	
	48	6,351,693	02/26/2002	Monie	
	49	6,400,958	06/02/2002	Richton	
	50	6,400,996	06/04/2002	Hoffberg et al.	
	51	6,437,692	08/20/2002	Petite et al.	
	52	6,478,233	11/12/2002	Shah	
	53	6,480,803	11/12/2002	Pierret et al.	
	54	6,483,906	11/19/2002	Lggulden et al.	
	55	6,536,675	03/25/2003	Pesko et al.	
	56	6,542,076	04/01/2003	Joao	
	57	6,549,130	04/15/2003	Joao	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 3 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Stelnberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	RFACT.011C2

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (If known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	58	6,574,537	06/02/2003	Kipersztok et al.	
	59	6,580,950	08/17/2003	Johnson	
	60	6,594,825	07/15/2003	Goldschmidt et al.	
	61	6,595,430	07/22/2003	Shah	
	62	6,598,066	07/22/2003	Hull et al.	
	63	6,619,555	09/16/2003	Rosen	
	64	6,622,097	09/16/2003	Hunter	
	65	6,622,115	09/16/2003	Brown et al.	
	66	6,622,925	09/23/2003	Carter et al.	
	67	6,622,926	09/23/2003	Sartain et al.	
	68	6,628,997	09/30/2003	Fox et al.	
	69	6,633,823	10/14/2003	Bartone et al.	
	70	6,643,567	11/04/2003	Kolk et al.	
	71	6,644,098	11/11/2003	Cardinale et al.	
	72	6,671,586	12/30/2003	Davis et al.	
	73	6,695,218	02/24/2004	Fleckenstein	
	74	6,700,224	03/02/2004	Biskup, Sr.,	
	75	6,726,113	04/27/2004	Guo	
	76	6,731,992	05/04/2004	Ziegler	
	77	6,734,806	05/11/2004	Cratsley	
	78	6,772,052	08/03/2004	Amundsen	
	79	6,785,592	08/31/2004	Smith	
	80	6,785,630	08/31/2004	Kolk	
	81	6,786,421	09/07/2004	Rosen	
	82	6,789,739	09/14/2004	Rosen	
	83	6,853,959	02/08/2005	Ikeda et al.	
	84	6,868,293	03/15/2005	Schurr	
	85	6,868,319	03/15/2005	Kipersztok et al.	
	86	6,882,712	04/19/2005	Igguiden et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
SHEET 4 OF 10	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	87	6,889,908	05/10/2005	Crippen et al.	
	88	6,891,838	05/10/2005	Petite et al.	
	89	6,912,429	06/28/2005	Bilger	
	90	6,991,029	01/31/2006	Orfield et al.	
	91	7,009,493	03/07/2006	Howard	
	92	7,031,880	04/18/2006	Seem et al.	
	93	7,039,532	05/02/2006	Hunter	
	94	7,061,393	06/13/2006	Buckingham et al.	
	95	7,089,088	08/08/2006	Terry et al.	
	96	7,130,719	10/31/2006	Ehlers et al.	
	97	7,130,832	10/31/2006	Bannai et al.	
	98	7,167,079	01/23/2007	Smyth et al.	
	99	7,187,986	03/06/2007	Johnson et al.	
	100	7,205,892	04/17/2007	Luebke et al.	
	101	7,206,670	04/17/2007	Pimputkar, et al.	
	102	7,215,746	05/08/2007	Iggulden et al.	
	103	7,216,015	05/08/2007	Poth Robert J.	
	104	7,231,424	06/11/2007	Bodin et al.	
	105	7,232,075	06/19/2007	Rosen	
	106	7,242,988	07/10/2007	Hoffberg et al.	
	107	7,260,823	08/21/2007	Schlack et al.	
	108	7,356,384	04/08/2008	Gull et al.	
	109	7,476,020	01/13/2009	Zufferey et al.	
	110	7,483,964	01/27/2009	Jackson et al.	
	111	7,644,869	01/12/2010	Hoglund et al.	
	112	7,702,424	04/20/2010	Cannon et al.	
	113	7,758,729	07/20/2010	DeWhitt	
	114	7,784,704	08/31/2010	Harter	
	115	7,848,900 (EFACT.005A)	12/07/2010	Steinberg et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
SHEET 5 OF 10	Examiner	Unknown
	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	116	7,869,904	01/11/2011	Cannon et al.	
	117	7,894,943	02/22/2011	Sloup et al.	
	118	7,908,116 (EFACT.004A)	03/15/2011	Steinberg et al.	
	119	7,908,117 (EFACT.003A)	03/15/2011	Steinberg et al.	
	120	8,010,237 (EFACT.010A)	08/30/2011	Cheung Leo et al.	
	121	8,019,567 (EFACT.006A)	09/13/2011	Steinberg et al.	
	122	8,090,477 (EFACT.013A)	01/03/2012	Steinberg	
	123	8,131,497 (EFACT.005C1)	03/06/2012	Steinberg et al.	
	124	8,131,506 (EFACT.004C1)	03/06/2012	Steinberg et al.	
	125	8,180,492 (EFACT.011A)	05/15/2012	Steinberg	
	126	8,340,826 (EFACT.013C1)	12/25/2012	Steinberg et al.	
	127	8,412,488 (EFACT.004C2)	04/02/2013	Steinberg et al.	
	128	8,423,322 (EFACT.006C1)	04/16/2013	Steinberg et al.	
	129	8,428,785	04/23/2013	Boucher et al.	
	130	8,457,797	06/04/2013	Imes et al.	
	131	8,498,753 (EFACT.009A)	07/30/2013	Steinberg et al.	
	132	8,556,188 (EFACT.012A)	10/15/2013	Steinberg	
	133	8,586,550 (EFACT.007A)	12/03/2013	Steinberg et al.	
	134	8,712,590 (EFACT.013C2)	04/29/2014	Steinberg	
	135	8,738,327 (EFACT.004C3)	05/27/2014	Steinberg, et al.	
	136	8,740,100 (EFACT.008A)	06/03/2014	Steinberg	
	137	8,751,186 (EFACT.005C3)	06/10/2014	Steinberg, et al.	
	138	8,840,033 (EFACT.012C1)	09/23/2014	Steinberg	
	139	8,850,348	09/30/2014	Fadell et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 6 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	140	8,886,488 (EFACT.006C2)	11/11/2014	Steinberg, et al.	
	141	9,057,649 (EFACT.006C2)	08/16/2015	Steinberg, et al.	
	142	9,134,710 (EFACT.010C1)	09/15/2015	Cheung et al.	
	143	9,194,597 (EFACT.007C1)	11/24/2015	Steinberg, et al.	
	144	2003/0040934	02/27/2003	Skidmore et al.	
	145	2004/0176880	09/09/2004	Obradovich et al.	
	146	2005/0222889	10/06/2005	Lai et al.	
	147	2005/0288822	12/29/2005	Rayburn	
	148	2006/0045105	03/02/2006	Dobosz et al.	
	149	2006/0214014	09/28/2006	Bash et al.	
	150	2007/0043477	02/22/2007	Elhers et al.	
	151	2007/0045431	03/03/2007	Chapman et al.	
	152	2007/0146126	06/28/2007	Wang	
	153	2008/0083234	04/10/2008	Krebs et al.	
	154	2008/0198549	08/21/2008	Rasmussen et al.	
	155	2008/0281472	11/13/2008	Podgorny et al.	
	156	2009/0052859	02/26/2009	Greenberger et al.	
	157	2009/0099699	04/16/2009	Steinberg et al.	
	158	2009/0125151	06/14/2009	Steinberg et al.	
	159	2009/0240381	09/24/2009	Lane	
	160	2009/0281667	11/12/2009	Masui et al.	
	161	2010/0019052	01/28/2010	Yip	
	162	2010/0070086	03/18/2010	Harrod et al.	
	163	2010/0070089	03/18/2010	Harrod et al.	
	164	2010/0070093	03/18/2010	Harrod et al.	
	165	2010/0156608	06/24/2010	BAE et al.	
	166	2010/0162285	06/24/2010	Cohen et al.	
	167	2010/0211224	08/19/2010	Keeling et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
SHEET 7 OF 10	Examiner	Unknown
	Attorney Docket No.	EPACT01102

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	168	2010/0235004	09/16/2010	Thind	
	169	2010/0289643	11/18/2010	Trundle et al.	
	170	2010/0318227	12/16/2010	Steinberg et al.	
	171	2011/0031323	02/10/2011	Nold et al.	
	172	2011/0046792	02/24/2011	Imes et al.	
	173	2011/0046798	02/24/2011	Imes et al.	
	174	2011/0046799	02/24/2011	Imes et al.	
	175	2011/0046800	02/24/2011	Imes et al.	
	176	2011/0046801	02/24/2011	Imes et al.	
	177	2011/0051823	03/03/2011	Imes et al.	
	178	2011/0054699	03/03/2011	Imes et al.	
	179	2011/0054710	03/03/2011	Imes et al.	
	180	2011/0173542	07/14/2011	Imes et al.	
	181	2011/0202185	08/18/2011	Imes et al.	
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	195	2012/0101637	04/26/2012	Imes et al.	
	196	2012/0135759	05/31/2012	Imes et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Hercwith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
SHEET 8 OF 10		Attorney Docket No. EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	197	2012/0215725	08/23/2012	Imes et al.	
	198	2012/0221151 (EFACT.011C1)	08/30/2012	Steinberg	
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	219	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 9 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	EFACT011C2

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	221	EP 0415747 A2	03/06/1991	Shaw et al.		
	222	JP 05-189659	07/30/1993	Hitachi Bill Shisetsu Eng. KK.		
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	231	WO 2013/187996	12/19/2013	EcoFactor, Inc.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	232	ARENS, et al., "How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings", 2005, research paper, Center for the Built Environment, Controls and Information Technology.	
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Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 10 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	EFACT.011C2

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
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012:18

Examiner Signature /AJAY OJHA/ (02/07/2018)	Date Considered 02/07/2018
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.O./

RESPONSE TO INFORMATIONAL NOTICE

First Inventor	: John Douglas Steinberg
App. No.	: 15/002,791
Filed	: January 21, 2016
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Art Unit	: 3744
Conf No.	: 4939

**Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

Dear Sir:

The above-captioned application was filed without a Declaration and/or Substitute Statement. Enclosed in compliance with 37 CFR 1.53(f) are the following.

- (X) Declaration for:
John Douglas Steinberg
- (X) Information Disclosure Statement.

Dated: January 19, 2017

By: John R. King/
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

25047624

PTO/AIA/US 100-121

Approved for use through 03/31/2014. COMD 0851-0032
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**Title of
Invention**SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN
ENERGY MANAGEMENT SYSTEM**

As the below named inventor, I hereby declare that:

This declaration
is directed to:

The attached application, or

United States application or PCT international application number **15/002791**
filed on **January 21, 2016**

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001
by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identify theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2036 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2036 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: **John Douglas Steinberg**

Date (Optional):

Signature: 

Note: An application data sheet (PTO/SB114 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/US form for each additional inventor.

This collection of information is required by 35 U.S.C. 116 and 37 CFR 1.63. This information is required to obtain or retain a benefit by the public which is to be paid by the USPTO in process of an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing the burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. (DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.)

If you need assistance in completing this form, call 1-800-PTO-9298 and select option 2.

Docket No.: EFACT.011C2

Customer No. 20,995

INFORMATION DISCLOSURE STATEMENT

First Inventor : John Douglas Steinberg

App. No. : 15/002,791

Filed : January 21, 2016

For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A
SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Examiner : Unknown

Art Unit : 3744

Conf. No. : 4939

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Copies of any listed foreign and non-patent literature references are being submitted.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a First Office Action on the merits, and presumably no fee is required. If a First Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 CFR 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: January 19, 2017

By: John R. King/
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

25047583

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 1 OF 2	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	17	CHENG et al., "Smart Sensors Enable Smart Air Conditioning Control", Sensors 2014, ISSN 1424-8220, June 24, 2014, 25 pages.	
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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 2 OF 2	Attorney Docket No.	EFACT.011C2

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	20	SKLAVOUNOS, "Detection of Abnormal Situations and Energy Efficiency Control in Heating Ventilation and Air Conditioning (HVAC) Systems", Brunel University thesis, September 2015, 151 pages.	
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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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Electronic Acknowledgement Receipt

EFS ID:	28106285
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Gustavo Lopez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	19-JAN-2017
Filing Date:	21-JAN-2016
Time Stamp:	13:33:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	EFACT-011C2_response.pdf	14476 36162c8d3012d4c86c1c562a0f054c845d0b0ca89	no	1

Warnings:

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Case 6:20-cv-00078-ADA Document 68-2 Filed 04/29/21 Page 1156 of 2039

Information:					
2	Oath or Declaration filed	EFACT-011C2_declaration.pdf	86085 7cc/85df6666dcd17655c5cd57337a972e466	no	1
Warnings:					
Information:					
3		EFACT-011C2_IDS.pdf	105875 ec59e1833d634ccc0f2711a6192f6a601161c4b	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	3	
Warnings:					
Information:					
4	Non Patent Literature	EFACT-011C2_ref17.pdf	1850599 ar2179038c4d463039d70d4c90c17148c90ccaf	no	25
Warnings:					
Information:					
5	Non Patent Literature	EFACT-011C2_ref18.pdf	673767 d567d4c5a5c62c039c18c52c4ba926d4d703932f	no	6
Warnings:					
Information:					
6	Non Patent Literature	EFACT-011C2_ref19.pdf	4809309 059c6c538a6737d99f6c6c7fa511c2c2752caa	no	144
Warnings:					
Information:					
7	Non Patent Literature	EFACT-011C2_ref20.pdf	5299725 572c4c317611b4a4e6d9627d3d311839c5d6f3e	no	151
Warnings:					
Information:					
0413					

8	Non Patent Literature	EFACT-011C2_ref21.pdf	197869 13c6a289c111d668997c7a8635c4c6d40c n8n3c	no	7
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/002,791	01/21/2016	John Douglas Steinberg	EPACT.011C2

CONFIRMATION NO. 4939

PUBLICATION NOTICE



OC000000083033627

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Title: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Publication No. US-2016-0138822-A1

Publication Date: 05/19/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/002,791	01/21/2016	John Douglas Steinberg	EPACT.011C2

CONFIRMATION NO. 4939

POA ACCEPTANCE LETTER



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 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 03/30/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/18/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/tnguyen/

Doc Code: PA..
 Document Description: Power of Attorney

PTO/AIA/82A (07-13)
 Approved for use through 11/30/2014. OMB 0651-0051
 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

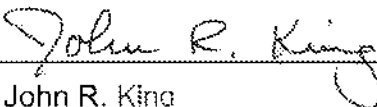
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	15/002791
Filing Date	January 21, 2016
First Named Inventor	John Douglas Steinberg
Title	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Art Unit	3744
Examiner Name	Unknown
Attorney Docket Number	EFACT.011C2

SIGNATURE of Applicant or Patent Practitioner

Signature		Date (Optional)	
Name	John R. King	Registration Number	34,362
Title (if Applicant is a juristic entity)	Attorney		
Applicant Name (if Applicant is a juristic entity)		EcoFactor, Inc.	

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800 PTO-9199 and select option 2.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82A (07-13)

Approved for use through 1/1/2014. CNR 0661-0001
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above.

OR

20995



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

EcoFactor, Inc.



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.40(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

John Douglas, Esq.

Title

EVP of Business Development

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.321, 1.322, and 1.33. The information is required to obtain or retain a benefit by the provision which is to be (and by the USPTO to process) an application. Confidentiality is assured by 35 U.S.C. 122 and 37 CFR 1.14 and 1.14. The collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22304-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22304-1480.

INFORMATION DISCLOSURE STATEMENT

First Inventor	: John Douglas Steinberg
App. No.	: 15/002,791
Filed	: January 21, 2016
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Unknown
Art Unit	: 3744
Conf. No.	: 4939

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Listed references are of record in U.S. Patent Application No. 13/470,074, filed May 11, 2012, which is the parent of this continuation application, and is relied upon for an earlier filing date under 35 USC 120. Copies of the references are not submitted pursuant to 37 CFR 1.98(d).

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a First Office Action on the merits, and presumably no fee is required. If a First Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner

Application No.: 15/002,791

Filing Date: January 21, 2016

is authorized to charge the fee set forth in 37 CFR 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 3-18-2016

By: John R. King
John R. King
Registration No. 34,352
Attorney of Record
Customer No. 20,995
(949) 760-0404

22813806/36
03/15/16

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/002791
	Filing Date	January 21, 2016
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	9,244,470 (EFACT.011C1)	01/26/2016	Steinberg	
	2	9,279,594 (EFACT.008C1)	03/08/2016	Steinberg	
	3	2006/0283965	12/21/2006	Mueller et al.	
	4	2008/0083234	04/10/2008	Krebs et al.	
	5	2016/0061474 (EFACT.010C2)	03/03/2016	Cheung et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	6	Raji, "Smart Networks for Control", IEEE Spectrum, June 1994.	

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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	25238640
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Kevin Kraus
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	18-MAR-2016
Filing Date:	21-JAN-2016
Time Stamp:	14:06:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	EFACT-011C2_transmittal.pdf	68649 e0172c0dc19c3edf5a8235015586d733e071c10f	no	1

Warnings:**Information:**

0422

2	Miscellaneous Incoming Letter	EFACT-011C2_rescission.pdf	109435 e0402f1766776516d461ea3c55ded0ca863 a7581	no	2
Warnings:					
Information:					
3	Power of Attorney	EFACT-011C2_POA.pdf	285435 83d1d17ca6c5403001ec69d3786e2516ce1 03ae1	no	2
Warnings:					
Information:					
4		EFACT-011C2_IDS.pdf	150026 a97926a1dc31ef408da0a1656a3276a2c5a 0a6a3	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
Total Files Size (in bytes):			613545		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Docket No.: EFACT.01102

Page 1 of 1

Please Direct All Correspondence to Customer Number 20,995

TRANSMITTAL LETTER

Inventor : John Douglas Steinberg
App. No. : 15/002,791
Filed : January 21, 2016
For : SYSTEM AND METHOD FOR
USING A WIRELESS DEVICE AS A
SENSOR FOR AN ENERGY
MANAGEMENT SYSTEM
Art Unit : 3744
Conf No. : 4939

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed are the following.

- (X) Rescission of Any Prior Disclaimers and Request to Revisit Art.
- (X) Power of Attorney by Applicant.
- (X) Information Disclosure Statement.

The present application qualifies for small entity status under 37 CFR § 1.27.

The Commissioner is hereby authorized to charge any additional fees which may be required, now or in the future, or credit any overpayment, to Account No. 11-1410.

Dated: 3-18-2016

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

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001716

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	John Douglas Steinberg
App. No.	:	15/002,791
Filed	:	January 21, 2016
For	:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	:	Unknown
GAU	:	3744
Conf. No.	:	4939

RESCISSION OF ANY PRIOR DISCLAIMERS AND REQUEST TO REVISIT ART

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The claims of the present application are different and possibly broader in scope than any pending claims in any related application or issued claims in any related patent. In particular, in the parent application, U.S. Patent Application No. 12/502,064, now U.S. Patent No. 8,180,492, issued May 15, 2012; and U.S. Patent Application No. 13/470,074, now U.S. Patent No. 9,244,470, issued January 26, 2016; Applicant amended claims and/or presented arguments in view of at least U.S. Patent No. 5,977,964; U.S. Publication Nos. 2008/0281472; and 2009/0065596; article "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings" by Wang, et al. and manuals from Johnson Controls (T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3) and Emerson Climate Technologies (Network Thermostat for E2 Building Controller Installation and Operation Manual 2007)

To the extent that any amendments or characterizations of the scope of any claim or referenced art could be construed as a disclaimer of any subject matter

Appl. No.: 15/002,791
Filed : January 21, 2016

Docket No. EFACT.011C2
Customer No. 20,995

supported by the present disclosure, Applicant hereby rescinds and retracts such disclaimer. Accordingly, the above-listed references, or other listed or referenced art may need to be re-visited.

In addition, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 3-18-2016

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

22902580 ad
02/14/16

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-873						Applicant or Owner Number 15/000,791	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASE FEE (37 CFR 1.101(a)-(c), (d)-(e))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.102(a)-(c), (d)-(e))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.103(a)-(c), (d)-(e))	N/A	N/A	N/A	300		N/A	
TOTAL CLAIMS (37 CFR 1.101)	18	minus 10*	< 40	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.101)	2	minus 3**	< 210	0.00			
APPLICATION SIZE FEE (37 CFR 1.101(a))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(C) and 37 CFR 1.101(b).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.102)				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
AMENDMENT A	CLASS REEXAMINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
Top (37 CFR 1.102)	1	10	*	< 40	x	x	x
Independent (37 CFR 1.102)	1	10	*	< 40	x	x	x
Application Size Fee (37 CFR 1.101)							
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)							
			TOTAL ADD'L FEE		TOTAL ADD'L FEE		
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
AMENDMENT B	CLASS REEXAMINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
Top (37 CFR 1.102)	1	10	*	< 40	x	x	x
Independent (37 CFR 1.102)	1	10	*	< 40	x	x	x
Application Size Fee (37 CFR 1.101)							
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)							
			TOTAL ADD'L FEE		TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3. ** If the Highest Number Previously Paid For (in THIS SPACE) is less than 20, enter "20". *** If the Highest Number Previously Paid For (in THIS SPACE) is less than 3, enter "3". The Highest Number Previously Paid For (Total or Independent) is the highest found in the appropriate box in column 2.							



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 150
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/002,791	01/21/2016	John Douglas Steinberg	EPACT.011C2

CONFIRMATION NO. 4939

INFORMAL NOTICE



OC000000080362339

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 02/08/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
 John Douglas Steinberg

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/hchin/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Assistant COMMISSIONER FOR PATENTS
P.O. Box 150
Alexandria, Virginia 22313-1150
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FILITE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/002,791	01/21/2016	3744	800	IEFACT011C2	18	2

CONFIRMATION NO. 4939

FILING RECEIPT



0000000080362338

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Date Mailed: 02/08/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

John Douglas Steinberg, Millbrae, CA;

Applicant(s)

EcoFactor, Inc., Redwood City, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/470,074 05/11/2012 PAT 9244470
which is a CON of 12/502,064 07/13/2009 PAT 8180492
which claims benefit of 61/134,714 07/14/2008

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/04/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/002,791**

Projected Publication Date: 05/19/2016

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Preliminary Class

236

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 1 OF 10	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	H2176	12/05/2006	Meyer et al.	
	2	12/805705	06/10/2010	Crabtree	
	3	13/470074	08/30/2012	Steinberg	
	4	13/523697	06/14/2012	Hubiou et al.	
	5	13/725447	06/06/2013	Steinberg	
	6	13/729401	12/28/2012	Sloop	
	7	13/852577	03/28/2013	Steinberg et al.	
	8	13/858710	09/05/2013	Steinberg et al.	
	9	13/861189	04/11/2013	Steinberg et al.	
	10	14/082,675 (EFACT.007C1)	11/18/2003	Steinberg et al.	
	11	14/263,762	04/28/2014	Steinberg	
	12	14/285,384	05/22/2014	Steinberg, et al.	
	13	14/292,377	05/30/2014	Steinberg	
	14	14/491,554	09/19/2014	Steinberg	
	15	14/527,433	10/29/2014	Steinberg, et al.	
	16	14/731,221	06/04/2015	Steinberg, et al.	
	17	D 646,990	10/18/2011	Rhodes	
	18	D 659,560	05/15/2012	Rhodes	
	19	D 673,467	01/01/2013	Lee et al.	
	20	D 705,095 (EFACT.015DA)	05/20/2014	Steinberg et al.	
	21	4,136,732	01/30/1979	Demaray et al.	
	22	4,341,345	07/27/1982	Hammer et al.	
	23	4,403,644	09/13/1983	Hebert	
	24	4,475,685	10/09/1984	Grimado et al.	
	25	4,655,279	04/07/1987	Harmon	
	26	4,674,027	06/16/1987	Beckey	
	27	5,124,502	06/23/1992	Nelson et al.	
	28	5,244,146	09/14/1993	Jefferson et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 2 OF 10	Attorney Docket No.	REACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	5,270,952	12/14/1993	Adams et al.	
	30	5,314,004	05/24/1994	Strand et al.	
	31	5,348,078	09/20/1994	Dushane et al.	
	32	5,462,225	10/31/1995	Massara et al.	
	33	5,544,036	08/06/1996	Brown et al.	
	34	5,555,927	09/17/1996	Shah	
	35	5,572,438	11/05/1996	Ehlers et al.	
	36	5,682,949	11/04/1997	Ratcliffe et al.	
	37	5,717,609	02/10/1998	Packa et al.	
	38	5,725,148	03/10/1998	Hartman	
	39	5,729,474	03/17/1998	Hildebrand et al.	
	40	5,818,347	10/06/1998	Dolan et al.	
	41	5,977,964	11/02/1999	Williams et al.	
	42	6,079,626	06/27/2000	Hartman	
	43	6,115,713	09/05/2000	Pascucci et al.	
	44	6,145,751	11/14/2000	Ahmed	
	45	6,178,362	01/23/2001	Woolard et al.	
	46	6,260,765	07/17/2001	Natale et al.	
	47	6,241,156	06/05/2001	Kline et al.	
	48	6,351,693	02/26/2002	Monie	
	49	6,400,956	06/02/2002	Richton	
	50	6,400,996	06/04/2002	Hoffberg et al.	
	51	6,437,692	08/20/2002	Petite et al.	
	52	6,478,233	11/12/2002	Shah	
	53	6,480,803	11/12/2002	Pierret et al.	
	54	6,483,906	11/19/2002	Lggulden et al.	
	55	6,536,675	03/25/2003	Pesko et al.	
	56	6,542,076	04/01/2003	Joao	
	57	6,549,130	04/15/2003	Joao	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 3 OF 10	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
	Examiner	Unknown
	Attorney Docket No.	EFAC1.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	58	6,574,537	06/02/2003	Kipersztok et al.	
	59	6,580,950	06/17/2003	Johnson	
	60	6,594,825	07/15/2003	Goldschmidtliki et al.	
	61	6,595,430	07/22/2003	Shah	
	62	6,598,056	07/22/2003	Hull et al.	
	63	6,619,555	09/16/2003	Rosen	
	64	6,622,097	09/16/2003	Hunter	
	65	6,622,115	09/16/2003	Brown et al.	
	66	6,622,925	09/23/2003	Carner et al.	
	67	6,622,926	09/23/2003	Sartain et al.	
	68	6,628,997	09/30/2003	Fox et al.	
	69	6,633,823	10/14/2003	Bartone et al.	
	70	6,643,567	11/04/2003	Kolk et al.	
	71	6,644,098	11/11/2003	Cardinale et al.	
	72	6,671,586	12/30/2003	Davis et al.	
	73	6,695,218	02/24/2004	Fleckenstein	
	74	6,700,224	03/02/2004	Biskup, Sr.,	
	75	6,726,113	04/27/2004	Guo	
	76	6,731,992	05/04/2004	Ziegler	
	77	6,734,806	05/11/2004	Cratsley	
	78	6,772,052	08/03/2004	Amundsen	
	79	6,785,592	08/31/2004	Smith	
	80	6,785,630	08/31/2004	Kolk	
	81	6,786,421	09/07/2004	Rosen	
	82	6,789,739	09/14/2004	Rosen	
	83	6,853,959	02/08/2005	Ikeda et al.	
	84	6,868,293	03/15/2005	Schurr	
	85	6,868,319	03/15/2005	Kipersztok et al.	
	86	6,882,712	04/19/2005	Iggulden et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
SHEET 4 OF 10		Examiner
		Attorney Docket No.
		EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	87	6,889,908	05/10/2005	Crippen et al.	
	88	6,891,838	05/10/2005	Petite et al.	
	89	6,912,429	06/28/2005	Bilger	
	90	6,991,029	01/31/2006	Orfield et al.	
	91	7,009,493	03/07/2006	Howard	
	92	7,031,880	04/18/2006	Seem et al.	
	93	7,039,532	05/02/2006	Hunter	
	94	7,061,393	06/13/2006	Buckingham et al.	
	95	7,089,088	08/08/2006	Terry et al.	
	96	7,130,719	10/31/2006	Ehlers et al.	
	97	7,130,832	10/31/2006	Bannai et al.	
	98	7,167,079	01/23/2007	Smyth et al.	
	99	7,187,986	03/06/2007	Johnson et al.	
	100	7,205,892	04/17/2007	Luebke et al.	
	101	7,206,670	04/17/2007	Pimputkar, et al.	
	102	7,215,746	05/08/2007	Iggulden et al.	
	103	7,216,015	05/08/2007	Poth Robert J.	
	104	7,231,424	06/11/2007	Bodin et al.	
	105	7,232,075	06/19/2007	Rosen	
	106	7,242,988	07/10/2007	Hoffberg et al.	
	107	7,260,823	08/21/2007	Schiack et al.	
	108	7,356,384	04/08/2008	Gull et al.	
	109	7,476,020	01/13/2009	Zufferey et al.	
	110	7,483,964	01/27/2009	Jackson et al.	
	111	7,644,869	01/12/2010	Hoglund et al.	
	112	7,702,424	04/20/2010	Cannon et al.	
	113	7,758,729	07/20/2010	DeWhitt	
	114	7,784,704	08/31/2010	Harter	
	115	7,848,900 (EFACT.005A)	12/07/2010	Steinberg et al.	

Examiner Signature	Date Considered
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 5 OF 10	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	116	7,869,904	01/11/2011	Cannon et al.	
	117	7,894,943	02/22/2011	Sloup et al.	
	118	7,908,116 (EFACT.004A)	03/15/2011	Steinberg et al.	
	119	7,908,117 (EFACT.003A)	03/15/2011	Steinberg et al.	
	120	8,010,237 (EFACT.010A)	08/30/2011	Cheung Leo et al.	
	121	8,019,567 (EFACT.006A)	09/13/2011	Steinberg et al.	
	122	8,090,477 (EFACT.013A)	01/03/2012	Steinberg	
	123	8,131,497 (EFACT.005C1)	03/06/2012	Steinberg et al.	
	124	8,131,506 (EFACT.004C1)	03/06/2012	Steinberg et al.	
	125	8,180,492 (EFACT.011A)	05/15/2012	Steinberg	
	126	8,340,826 (EFACT.013C1)	12/25/2012	Steinberg et al.	
	127	8,412,488 (EFACT.004C2)	04/02/2013	Steinberg et al.	
	128	8,423,322 (EFACT.006C1)	04/16/2013	Steinberg et al.	
	129	8,428,785	04/23/2013	Boucher et al.	
	130	8,457,797	06/04/2013	Imes et al.	
	131	8,498,753 (EFACT.009A)	07/30/2013	Steinberg et al.	
	132	8,556,188 (EFACT.012A)	10/15/2013	Steinberg	
	133	8,596,550 (EFACT.007A)	12/03/2013	Steinberg et al.	
	134	8,712,590 (EFACT.013C2)	04/29/2014	Steinberg	
	135	8,738,327 (EFACT.004C3)	05/27/2014	Steinberg, et al.	
	136	8,740,100 (EFACT.008A)	06/03/2014	Steinberg	
	137	8,751,186 (EFACT.005C3)	06/10/2014	Steinberg, et al.	
	138	8,840,033 (EFACT.012C1)	09/23/2014	Steinberg	
	139	8,850,348	09/30/2014	Fadell et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 6 OF 10	Attorney Docket No.	EFACT,011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	140	8,886,488 (EFACT.005C2)	11/11/2014	Steinberg, et al.	
	141	9,057,649 (EFACT.006C2)	06/16/2015	Steinberg, et al.	
	142	9,134,710 (EFACT.010C1)	09/15/2015	Cheung et al.	
	143	9,194,597 (EFACT.007C1)	11/24/2015	Steinberg, et al.	
	144	2003/0040934	02/27/2003	Skidmore et al.	
	145	2004/0176880	09/09/2004	Obradovich et al.	
	146	2005/0222889	10/06/2005	Lai et al.	
	147	2005/0288822	12/29/2005	Rayburn	
	148	2006/0045105	03/02/2006	Dobosz et al.	
	149	2006/0214014	09/28/2006	Bash et al.	
	150	2007/0043477	02/22/2007	Elhers et al.	
	151	2007/0045431	03/03/2007	Chapman et al.	
	152	2007/0146126	06/28/2007	Wang	
	153	2008/0083234	04/10/2008	Krebs et al.	
	154	2008/0198549	08/21/2008	Rasmussen et al.	
	155	2008/0281472	11/13/2008	Podgorny et al.	
	156	2009/0052859	02/26/2009	Greenberger et al.	
	157	2009/0099699	04/16/2009	Steinberg et al.	
	158	2009/0125151	05/14/2009	Steinberg et al.	
	159	2009/0240381	09/24/2009	Lane	
	160	2009/0281667	11/12/2009	Masui et al.	
	161	2010/0019052	01/28/2010	Yip	
	162	2010/0070086	03/18/2010	Harrod et al.	
	163	2010/0070089	03/18/2010	Harrod et al.	
	164	2010/0070093	03/18/2010	Harrod et al.	
	165	2010/0156608	06/24/2010	BAE et al.	
	166	2010/0162285	06/24/2010	Cohen et al.	
	167	2010/0211224	08/19/2010	Keeling et al.	

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	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 7 OF 10	Attorney Docket No.	BFAC7.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	168	2010/0235004	09/16/2010	Thind	
	169	2010/0289643	11/18/2010	Trundle et al.	
	170	2010/0318227	12/16/2010	Steinberg et al.	
	171	2011/0031323	02/10/2011	Nold et al.	
	172	2011/0046792	02/24/2011	Imes et al.	
	173	2011/0046798	02/24/2011	Imes et al.	
	174	2011/0046799	02/24/2011	Imes et al.	
	175	2011/0046800	02/24/2011	Imes et al.	
	176	2011/0046801	02/24/2011	Imes et al.	
	177	2011/0051823	03/03/2011	Imes et al.	
	178	2011/0054699	03/03/2011	Imes et al.	
	179	2011/0054710	03/03/2011	Imes et al.	
	180	2011/0173542	07/14/2011	Imes et al.	
	181	2011/0202185	08/18/2011	Imes et al.	
	182	2011/0214060	09/01/2011	Imes et al.	
	183	2011/0224838	09/15/2011	Imes et al.	
	184	2011/0246898	10/06/2011	Imes et al.	
	185	2011/0253796	10/20/2011	Posa et al.	
	186	2011/0290893	12/01/2011	Steinberg	
	187	2011/0307101	12/15/2011	Imes et al.	
	188	2012/0023225	01/26/2012	Imes et al.	
	189	2012/0046859	02/23/2012	Imes et al.	
	190	2012/0064923	03/15/2012	Imes et al.	
	191	2012/0065935	03/15/2012	Steinberg et al.	
	192	2012/0072033	03/22/2012	Imes et al.	
	193	2012/0086562	04/12/2012	Steinberg	
	194	2012/0093141	04/19/2012	Imes et al.	
	195	2012/0101637	04/26/2012	Imes et al.	
	196	2012/0135759	05/31/2012	Imes et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 8 OF 10	Attorney Docket No.	EFACT.011C2

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	197	2012/0215725	08/23/2012	Imes et al.	
	198	2012/0221151 (EFACT.011C1)	08/30/2012	Steinberg	
	199	2012/0221718	08/30/2012	Imes et al.	
	200	2012/0252430	10/04/2012	Imes et al.	
	201	2012/0324119	12/20/2012	Imes et al.	
	202	2013/0053054	02/28/2013	Lovitt et al.	
	203	2013/0054758	02/28/2013	Imes et al.	
	204	2013/0054863	02/28/2013	Imes et al.	
	205	2013/0060387	03/07/2013	Imes et al.	
	206	2013/0144453	06/06/2013	Subbloie	
	207	2013/0167035	06/27/2013	Imes et al.	
	208	2013/0173064	07/04/2013	Fadell et al.	
	209	2013/0178985	07/11/2013	Lombard et al.	
	210	2013/0226502 (EFACT.006C2)	08/29/2013	Steinberg, et al.	
	211	2013/0310989 (EFACT.009C1)	11/21/2013	Steinberg et al.	
	212	2013/0338837 (EFACT.014A)	12/19/2013	Hublou et al.	
	213	2014/0039690 (EFACT.012C1)	02/06/2014	Steinberg	
	214	2014/0229018 (EFACT.013C3)	08/20/2014	Steinberg	
	215	2014/0316581	10/26/2014	Fadell et al.	
	216	2015/0021405 (EFACT.008C1)	01/22/2015	Steinberg	
	217	2015/0025691	01/22/2015	Fadell et al.	
	218	2015/0043615 (EFACT.004C4)	02/12/2015	Steinberg et al.	
	219	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
	220	2015/0168001 (EFACT.012C2)	06/18/2015	Steinberg	

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	Art Unit	Unknown
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SHEET 9 OF 10	Attorney Docket No.	EFACT.011C2

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	221	EP 0415747 A2	03/06/1991	Shaw et al.		
	222	JP 05-189659	07/30/1993	Hitachi Bill Shisetsu Eng. KK.		
	223	JP 2010-038377	02/18/2010	Mitsubishi Heavy Ind. Ltd.		
	224	JP 2010-286218	12/24/2010	Mitsubishi Heavy Ind. Ltd.		
	225	KR 10-1994-0011902	06/22/1994	Koryo Digital Elect. Co.		
	226	KR 10-1999-0070368	09/15/1999	Samsung Electronics Co. Ltd.		
	227	KR 10-2000-0059532	10/05/2000	Dang Hae System Co.		
	228	WO 2005/098331 A1	10/20/2005	Zip Ind Aust Pty Ltd.		
	229	WO 2011/149600 (EFACT.012WO)	12/01/2011	EcoFactor, Inc.		
	230	WO 2012/024534 (EFACT.013WO)	02/23/2012	EcoFactor, Inc.		
	231	WO 2013/187996	12/19/2013	EcoFactor, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	232	ARENS, et al., "How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings", 2005, research paper, Center for the Built Environment, Controls and Information Technology.	
	233	Bourhan, et al., "Cynamic model of an HVAC system for control analysis", Elsevier 2004.	
	234	Brush, et al., Preheat – Controlling Home Heating with Occupancy Prediction, 2013.	
	235	Comverge SuperStat Flyer, prior to June 28, 2007.	
	236	Control4 Wireless Thermostat Brochure, 2006.	
	237	Cooper Power Systems Web Page, 2000-2009.	
	238	Emerson Climate Technologies, "Network Thermostat for E2 Building Controller Installation and Operation Manual", 2007.	
	239	Enernoc Web Page, 2004-2009.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	Unknown
	Filing Date	Herewith
	First Named Inventor	John Douglas Steinberg
	Art Unit	Unknown
(Multiple sheets used when necessary)	Examiner	Unknown
SHEET 10 OF 10	Attorney Docket No.	EFACT.011C2

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	240	Enerwise Website, 1999-2009.	
	241	Gupta, Adding GPS-Control to Traditional Thermostats: An Exploration of Potential Energy Savings and Design Challenges, MIT, 2009.	
	242	Gupta, et al., A Persuasive GPS-Controlled Thermostat System, MIT, 2008.	
	243	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome, 2004.	
	244	Honeywell, "W7600/W7620 Controller Reference Manual, HW0021207, October, 1992.	
	245	Johnson Controls, "T600HCx-3 Single-Stage Thermostats", 2006.	
	246	JOHNSON CONTROLS, Touch4 building automation system brochure, 2007.	
	247	KILICOTTE, et al., "Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York", Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA, August 13-18, 2006	
	248	Krumm, et al., Learning Time-Based Presence Probabilities, June 2011.	
	249	LIN, et al., "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002.	
	250	PIER, Southern California Edison, Demand Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report, February 14, 2006.	
	251	Proliphix Thermostat Brochure, prior to June 2007.	
	252	Scott, et al., Home Heating Using GPS-Based Arrival Prediction, 2010.	
	253	WANG, et al., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings," (2003), Center for Environmental Design Research.	
	254	WETTER, et al., A comparison of deterministic and probabilistic optimization algorithms for nonsmooth simulation-based optimization, Building and Environment 39, 2004, Pages 989-999.	
	255	International Search Report and Written Opinion for PCT/US2013/035726 (EFACT.014WO), dated 08/06/2013.	
	256	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO).	
	257	International Preliminary Report on Patentability in PCT/US2013/035726 dated 12/16/2014 (EFACT.014WO).	

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Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	2051	1	70	70
Petition:				
0442				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				800

Electronic Acknowledgement Receipt

EFS ID:	24685303
Application Number:	15002791
International Application Number:	
Confirmation Number:	4939
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Gustavo Lopez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C2
Receipt Date:	21-JAN-2016
Filing Date:	
Time Stamp:	14:19:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$800
RAM confirmation Number	558
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	EFACT-011C2_ADS.pdf	1561279	no	7
			e81d0c3c60673c7132e10d8dd71659a318ad2c		
Warnings:					
Information:					
2		EFACT-011C2_specification.pdf	863993	yes	16
			21a3c55693a2420af5da3a46a09c2da79c165a02		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	12	
	Claims		13	15	
	Abstract		16	16	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	EFACT-011C2_drawings.pdf	158721	no	8
			03ee8292cd09c0a08e93a290f2a0a05a9b258c		
Warnings:					
Information:					
4		EFACT-011C2_IDS.pdf	896841	yes	12
			1d11c107284c761168c0239c6877c2c121a8d13f		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	12	
Warnings:					
Information:					

5	Fee Worksheet (SB06)	fee-info.pdf	36920 036457620e510acc6225e43a3cd100c0a08 4e57	no	2
Warnings:					
Information:					
Total Files Size (in bytes):				3517754	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.78.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2. (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	--

Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	John	Douglas	Steinberg		
Residence Information (Select One) • US Residency Non US Residency Active US Military Service					
City	Millbrae	State/Province	CA	Country of Residence	US
Mailing Address of Inventor:					
Address 1		573 Hacienda Way			
Address 2					
City	Millbrae	State/Province	CA		
Postal Code	94030	Country	US		
All Inventors Must Be Listed • Additional inventor information blocks may be generated within this form by selecting the Add button.					
Add					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.			
Customer Number	20895		
Email Address	efiling@knobbe.com		Add Email Remove Email

Application Information:

Title of the Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Attorney Docket Number	EFACT.011C2	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	
Filing By Reference :			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").</p> <p>For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).</p>			
Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer number will be used for the Representative information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	26995		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(a), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending	-	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)			
	Continuation of	13/470074	2012-05-11			
Prior Application Status	Patented	-	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)	
13/470074	Continuation of	12/502064	2009-07-13	8186482	2012-05-15	
Prior Application Status	Expired	0488	Remove			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12/502064	Claims benefit of provisional	61/134714	2008-07-14
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX),¹ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country ¹	Filing Date (YYYY-MM-DD)	Access Code (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p><input type="checkbox"/> 16, 2013.</p> <p>NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p>

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.		
Applicant	1	<input type="button" value="Remove"/>
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>		
<input type="button" value="Clear"/>		
<input checked="" type="radio"/> Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		

Name of the Deceased or Legally Incapacitated Inventor :			
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	EcoFactor, Inc.		
Mailing Address Information For Applicant:			
Address 1	1450 Veteran's Boulevard		
Address 2	Suite 100		
City	Redwood City	State/Province	CA
Country	US	Postal Code	94063
Phone Number		Fax Number	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Assignee Information including Non-Aplicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee	1			
Complete this section if assignee information, including non-aplicant assignee information, is desired to be included on the patent application publication. An assignee-aplicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-aplicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
<input type="button" value="Remove"/>				
If the Assignee or Non-Aplicant Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Aplicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Aplicant Assignee Data may be generated within this form by selecting the Add button.				

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.					
Signature	John R. King		Date (YYYY-MM-DD)	2016-01-21	
First Name	John	Last Name	King	Registration Number	34362
Additional Signature may be generated within this form by selecting the Add button.					<input type="button" value="Add"/>

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C2
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EFACT.011C2

PATENT

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

RELATED APPLICATIONS

[0001] Any and all applications for which a foreign or domestic priority claim is identified in the Application Data Sheet, or any correction thereto, are hereby incorporated by reference into this application under 37 CFR 1.57.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

[0003] Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

[0004] These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

[0005] Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

[0006] A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals - ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can shift between multiple present temperatures at different times without real-time involvement of a human being.

[0007] Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at +/- 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

[0008] As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint - that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

[0009] In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by those systems. Hotel guests often turn the air conditioner to a low temperature setting and then leave the room for hours at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system. Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor

detects motion (which is assumed to coincide with the return of the guest), the HVAC system resets to the guest's chosen setting.

[0010] Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

[0011] It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

SUMMARY OF THE INVENTION

[0012] In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with one or more computers or other

consumer electronic devices which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the thermostats to their HVAC systems. The server also monitors and logs activity on the computers or other consumer electronic devices associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

[0013] At least one embodiment of the invention comprises the steps of determining whether one or more networked electronic devices inside a structure are in use; determining whether said use of said networked electronic devices indicates occupancy of said structure; and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

[0014] At least one embodiment of the invention comprises at least one said thermostat having at least one temperature setting associated with the presence of one or more occupants in said structure, and at least one temperature setting associated with the absence of occupants in said structure; one or more electronic devices having at least a user interface; where said electronic devices and said thermostat are connected to a network; where said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

[0016] Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

[0017] Figure 3 shows an embodiment of the website to be used as part of the subject invention.

[0018] Figure 4 shows a high-level schematic of the thermostat used as part of the subject invention.

[0019] Figure 5 shows one embodiment of the database structure used as part of the subject invention.

[0020] Figure 6 shows the browser as seen on the display of the computer used as part of the subject invention.

[0021] Figure 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

[0022] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] **Figure 1** shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

[0024] Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

[0025] When a user of the subject invention wishes to access information on network 102, the user initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn,

establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

[0026] One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

[0027] The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

[0028] In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

[0029] In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

[0030] Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Computers 104 can also be microprocessor- controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

[0031] Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices. The storage medium may comprise any method of storing information. It may comprise random access

memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data. Computers 104 and 106 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like. Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

[0032] **Figure 2** illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 112 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served as web pages and viewed by computers 104, as well as databases containing information used by the servers.

[0033] In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in **Figure 3**. Those components may include a means to enter temperature settings 202, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

[0034] **Figure 4** shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254,

memory 256, a display 258, a power source 260, a relay 262, which turns the HVAC system on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

[0035] The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

[0036] The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of the home, the solar orientation of the home, the location of the thermostat in the home, the user's preferred temperature settings, whether the user is a participant in a demand reduction program, etc.

[0037] As shown in **Figure 3**, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow

changing the settings of the temperature for all periods with a single gesture such as a mouse click.

[0038] **Figure 6** represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "No" button 1206. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

[0039] **Figure 7** represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 300 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccupied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under

such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

[0040] **Figure 8** is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system. In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's

programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you. Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

[0041] In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

WHAT IS CLAIMED IS:

1. A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint and at least a second HVAC temperature setpoint;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

prompting said one or more users, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and

keeping said current HVAC temperature setpoint based upon said input from said one or more users.

2. The method of Claim 1 wherein said wireless device is a remote control.

3. The method of Claim 1 wherein said wireless device is a wireless phone.

4. The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. The method of Claim 1 wherein said wireless device is a tablet computer.

6. The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server.

7. The method of Claim 1 in which said wireless device communicates with a remote server.

8. The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint and at least a second temperature setpoint;

at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint,

said application determining a probability that the specific activity status of said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure;

said application prompting said one or more users wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set to one of said first temperature setpoint or said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

11. The system of Claim 10 wherein said wireless device is a remote controller.

12. The system of Claim 10 wherein said wireless device is a wireless phone.

13. The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. The system of Claim 10 said wireless device is a tablet computer.

15. The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

16. The system of Claim 10 wherein said wireless device communicates with a remote server.

17. The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR
AN ENERGY MANAGEMENT SYSTEM

ABSTRACT OF THE DISCLOSURE

The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

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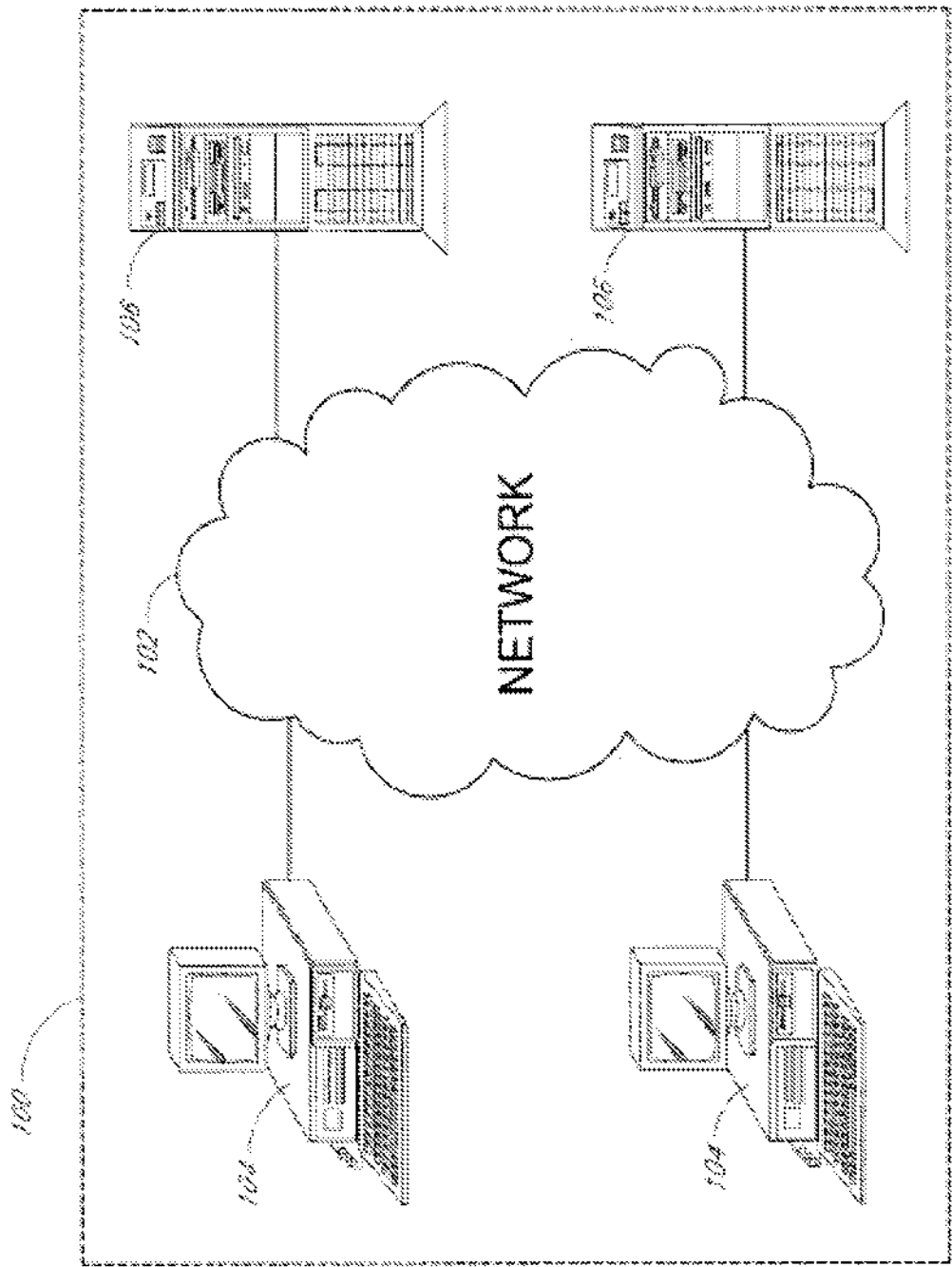
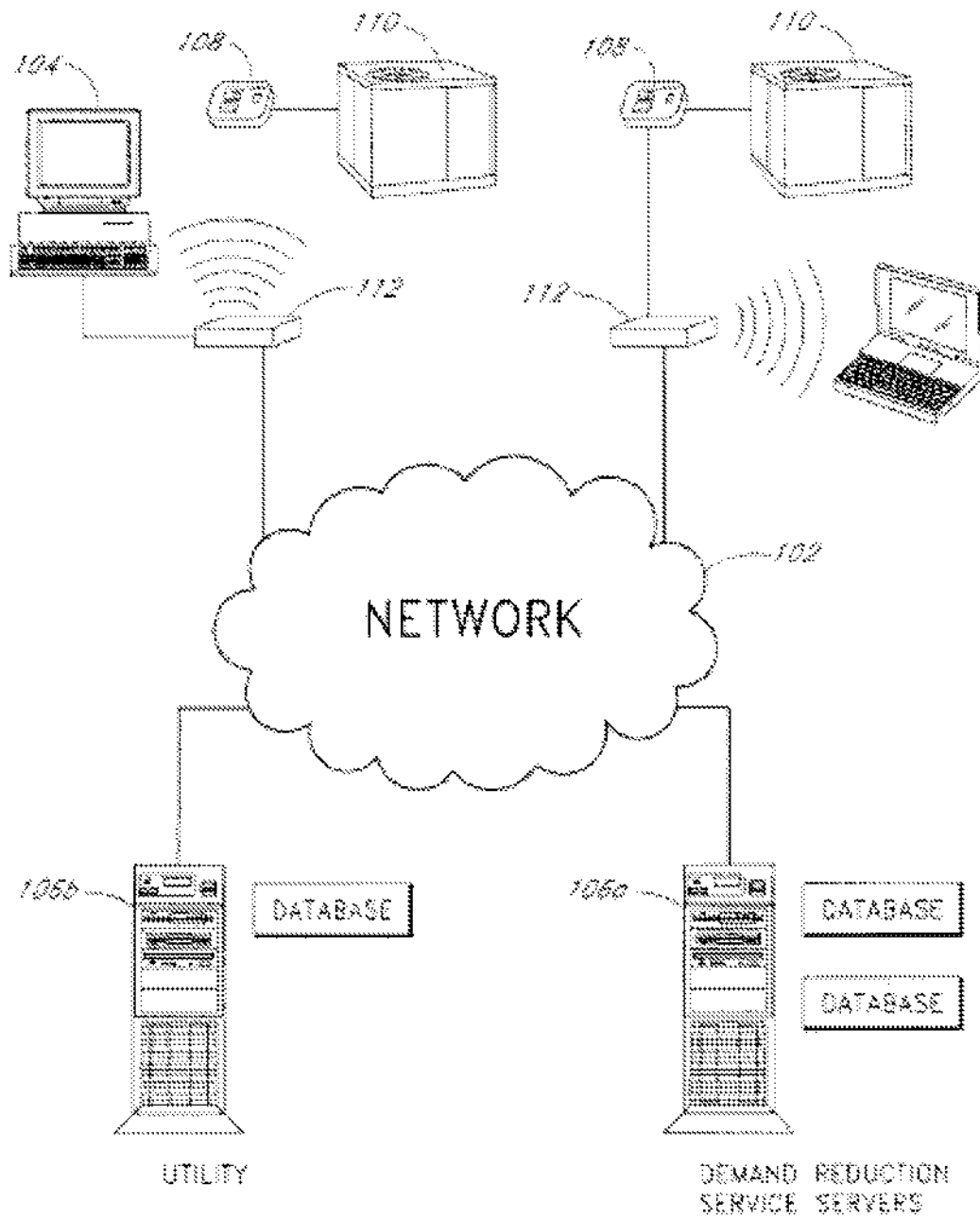


FIG. 1

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*FIG. 2*

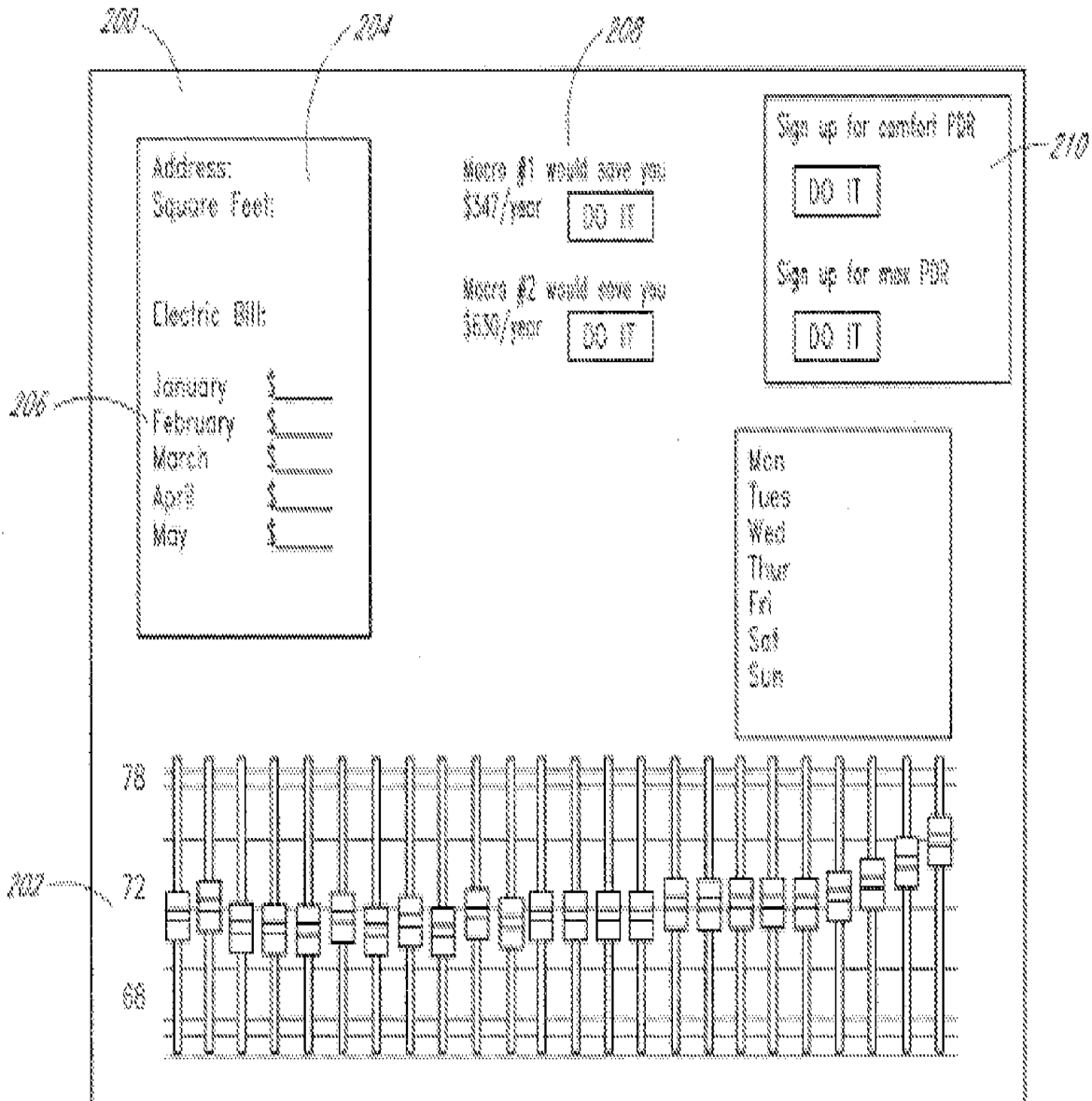


FIG. 3

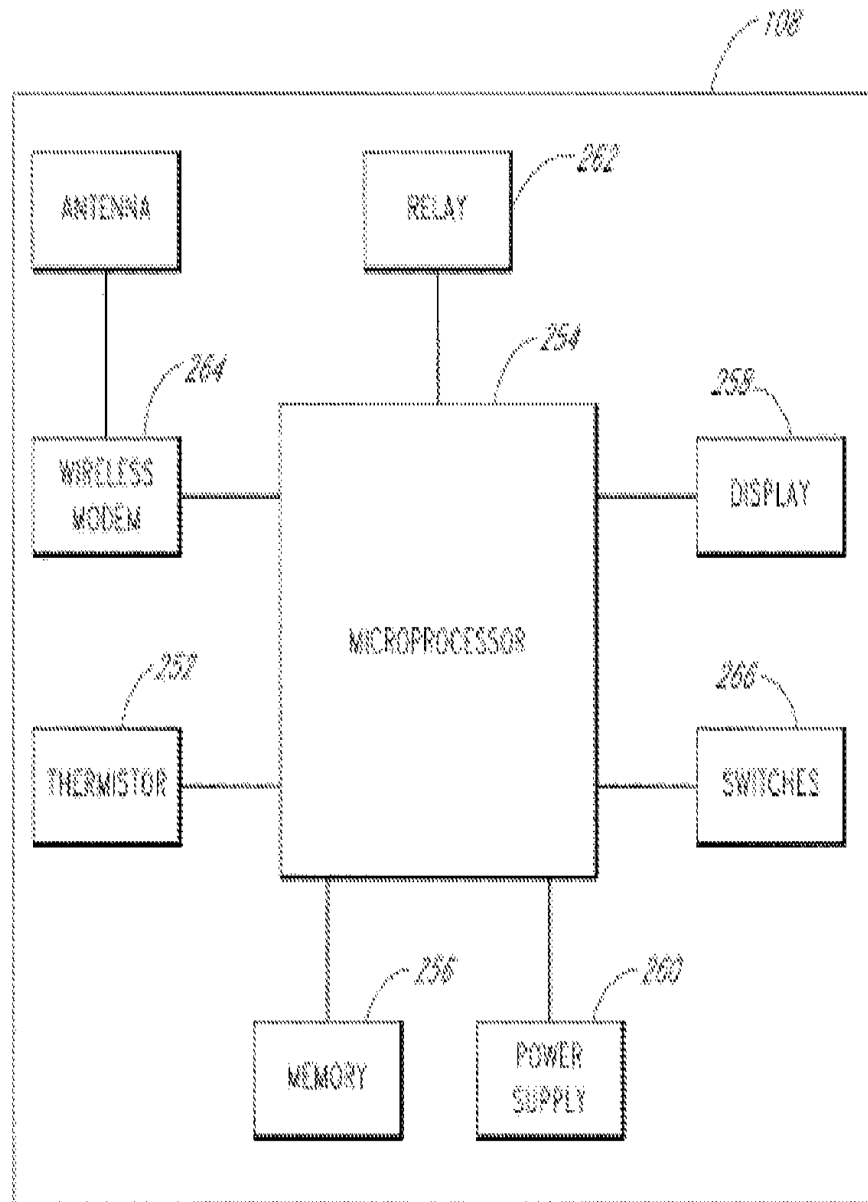


FIG. 4

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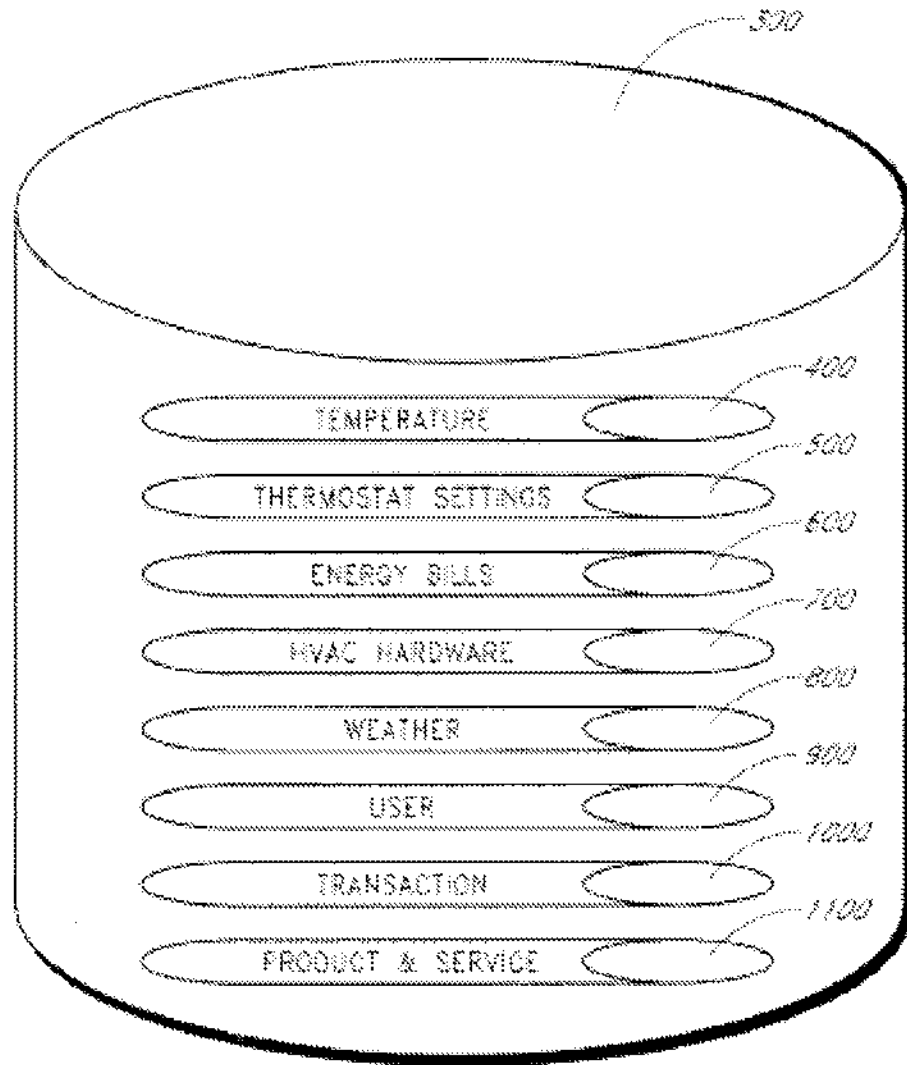


FIG. 5

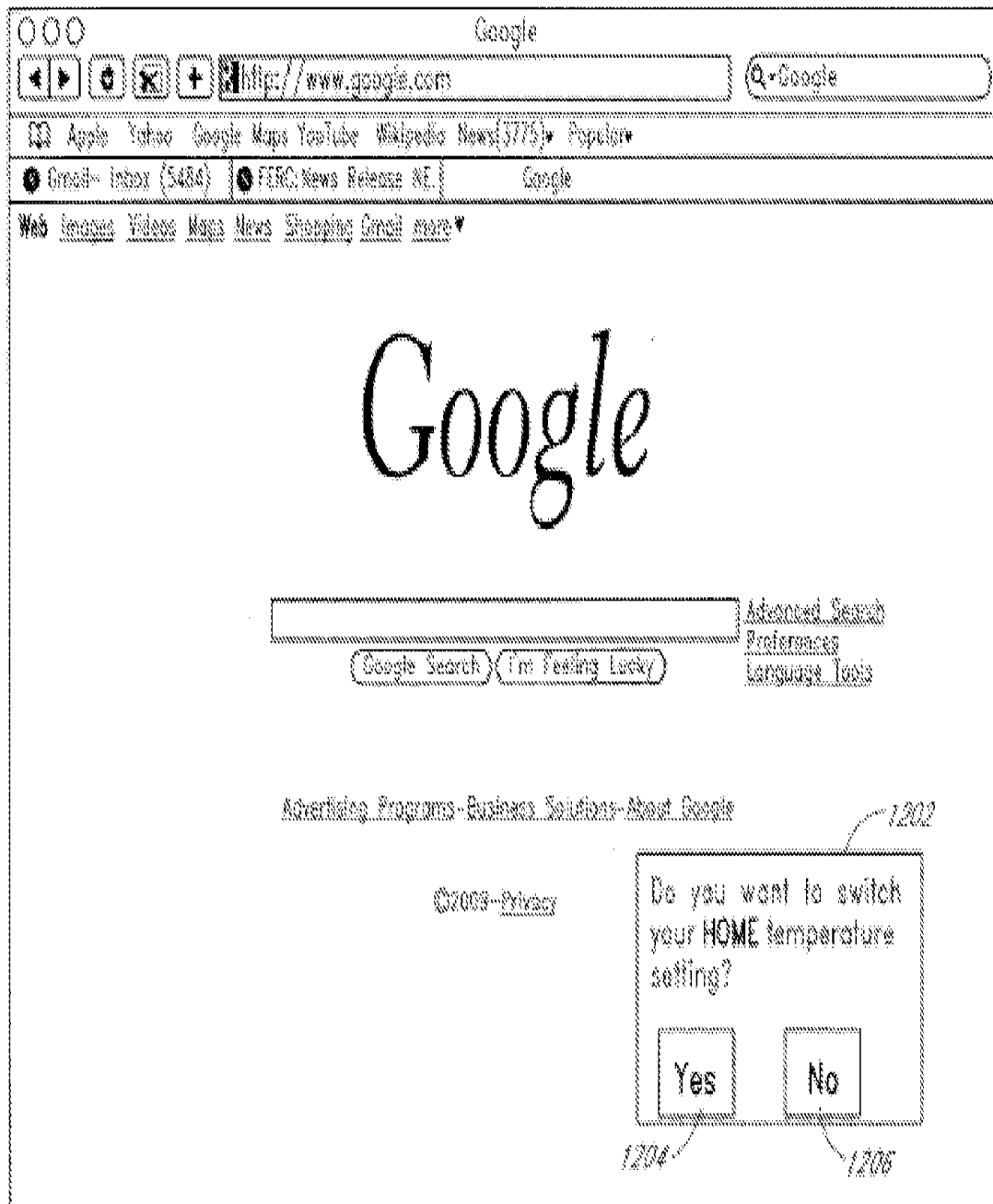
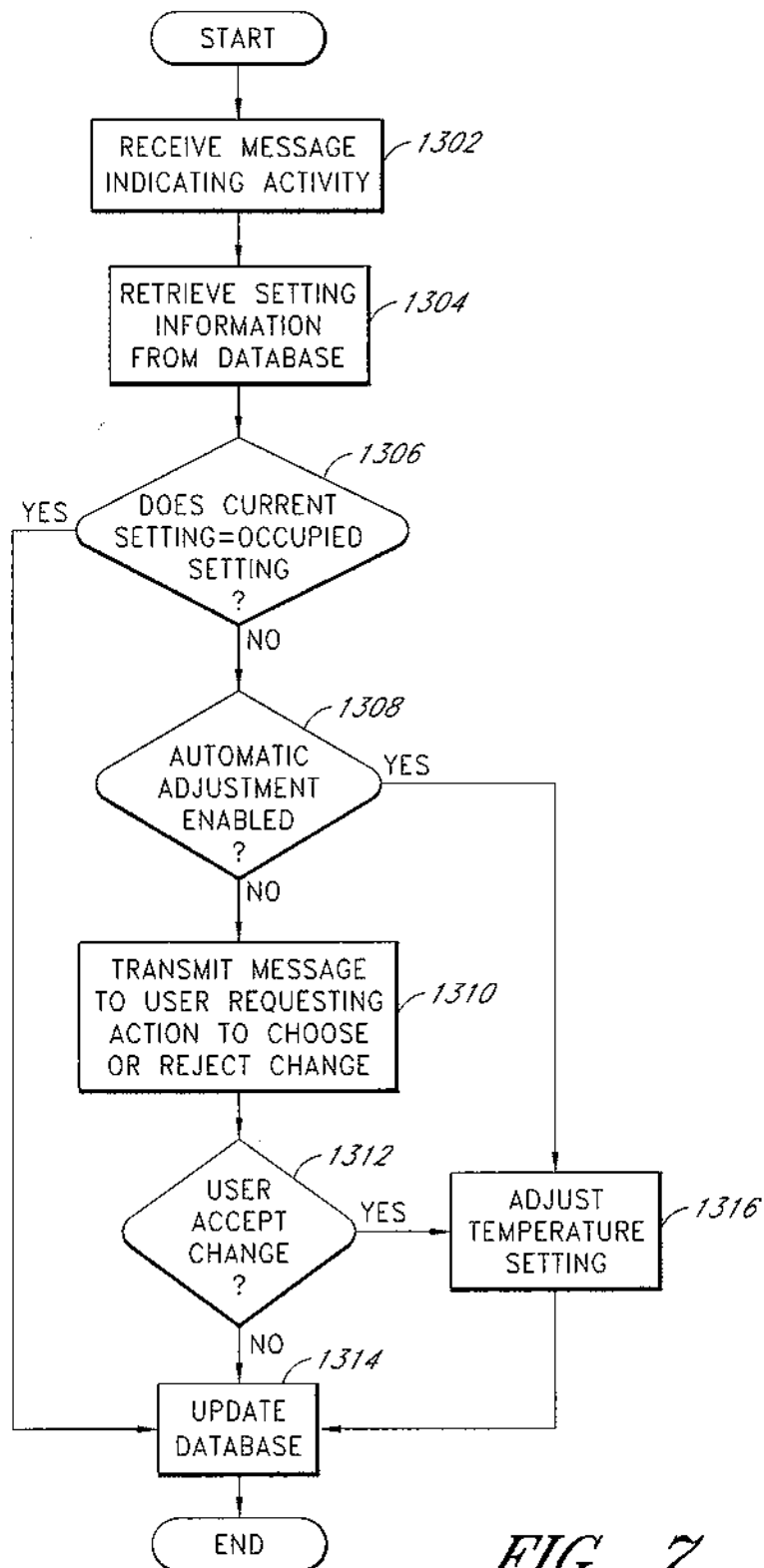
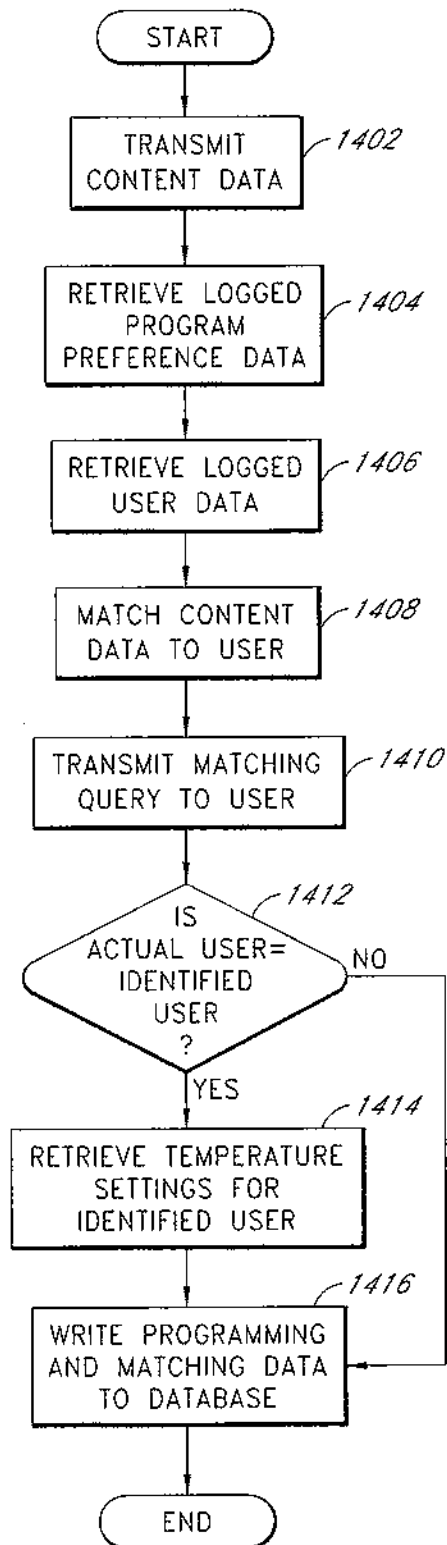


FIG. 6

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*FIG. 7*

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*FIG. 8*

INFORMATION DISCLOSURE STATEMENT

Inventor	:	John Douglas Steinberg
App. No.	:	Unknown
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For	:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
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Commissioner for Patents
P.O. Box 1450
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References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Listed references are of record in U.S. Patent Application No. 13/470,074, filed May 11, 2012, which is the parent of this continuation application, and is relied upon for an earlier filing date under 35 USC 120. Copies of the references are not submitted pursuant to 37 CFR 1.98(d).

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed within three months of the filing date or date of national phase entry, with an RCE or before receipt of a First Office Action after an RCE, and no fee is believed to be required.

Application No.: Unknown
Filing Date: Herewith

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: January 21, 2016

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

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13/476,074	05/11/2012	John Douglas Steinberg	EFACT/01HC1	103958

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 01/24/2020 has been accepted.

CERTIFICATIONS:**Change of Entity Status:**

☒ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/John R. King/
Name:	John R. King
Registration Number:	34362



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 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
 (application filed on or after May 29, 2000)

The Patent Term Adjustment is 850 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

John Douglas Steinberg, Millbrae, CA;

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PTO/SB/36 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary) SHEET 4 OF 5	Application No.	13/479074
	Filing Date	May 13, 2013
	First Named Inventor	John Douglas Steinberg
	Art Unit	2344
	Examiner	Ziad Karim
	Attorney Docket No.	EFACF01EC1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	83	2013/0080387	03/07/2013	Imes et al.	
	84	2013/0144453	06/06/2013	Sublime	
	85	2013/0167035	06/27/2013	Imes et al.	
	86	2013/0226502 EFACF 008C2	08/29/2013	Steinberg, et al.	
	87	2013/0310959 (EFACF 009C1)	11/21/2013	Steinberg et al.	
	88	2013/0338937 (EFACF 014A)	12/19/2013	Hublou et al.	
	89	2014/0039590 (EFACF 012C1)	02/06/2014	Steinberg	
	90	2014/0188290 (EFACF 007C1)	07/03/2014	EcoFactor, Inc. Steinberg, John Douglas, et al.	
	91	2014/0229018 (EFACF 013C3)	08/20/2014	Steinberg	
	92	2015/0021405 (EFACF 008C1)	01/22/2015	EcoFactor, Inc. Steinberg, John Douglas	
	93	2015/0043615 (EFACF 004C4)	02/12/2015	EcoFactor, Inc. Steinberg, John Douglas, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	94	JP 05-189659	07/30/1993	Hitachi Bill Shieetsu Eng. KK.		
	95	JP 2010-039377	02/13/2010	Mitsubishi Heavy Ind. Ltd.		
	96	JP 2010-286218	12/24/2010	Mitsubishi Heavy Ind. Ltd.		
	97	KR 10-1999-0070385	09/15/1999	Samsung Electronics Co. Ltd.		
	98	KR 10-2000-0059532	10/05/2000	Dang Hae System Co.		
	99	WO 2011/145500 (EFACF 012WO)	12/01/2011	EcoFactor, Inc.		
	100	WO 2012/024534 (EFACF 013WO)	02/23/2012	EcoFactor, Inc.		
	101	WO 2013/187995	12/19/2013	EcoFactor, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

Examiner Signature	Ziad Karim	Date Considered	03/23/2015
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant

T¹ - Place a check mark in this area when a U.S. Patent document is attached. **ALL REFERENCES CONSIDERED, EXCEPT WHERE LINED THROUGH. /Z.K./**

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2744 2127
(Multiple sheets used when necessary)	Examiner	Ziaul Karim
SHEET 1 OF 5	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	13/523697	06/14/2012	Hublou et al.	
	2	13/725447	06/06/2013	Steinberg	
	3	13/852577	03/28/2013	Steinberg et al.	
	4	13/858710	09/05/2013	Steinberg et al.	
	5	13/861189	04/11/2013	Steinberg et al.	
	6	14/263,762	04/28/2014	Steinberg	
	7	14/285,384	05/22/2014	Steinberg, et al.	
	8	14/292,377	05/30/2014	Steinberg	
	9	14/491,554	09/19/2014	Steinberg	
	10	14/527,433	10/29/2014	Steinberg, et al.	
	11	D 646,990	10/18/2011	Rhodes	
	12	D 659,560	05/15/2012	Rhodes	
	13	D 673,467	01/01/2013	Lee et al.	
	14	D 705,095 (EFACT.015DA)	05/20/2014	EcoFactor, Inc.	Steinberg, et al.
	15	5,124,502	06/23/1992	Nelson et al.	
	16	5,725,148	03/10/1998	Hartman	
	17	5,729,474	03/17/1998	Hildebrand et al.	
	18	6,079,626	06/27/2000	Hartman	
	19	6,115,713	09/05/2000	Pascucci et al.	
	20	6,241,156	06/05/2001	Kline et al.	
	21	6,400,956	06/02/2002	Richton	
	22	6,644,098	11/11/2003	Cardinale et al.	
	23	6,786,421	09/07/2004	Rosen	
	24	7,476,020	01/13/2009	Zufferey et al.	
	25	7,702,424	04/20/2010	Cannon et al.	
	26	7,758,729	07/20/2010	DeWhitt	
	27	7,894,943	02/22/2011	Sloup et al.	
	28	7,908,116 (EFACT.004A)	03/15/2011	Steinberg et al.	

Change(s) applied
to document
/R.F./
9/28/2015

Examiner Signature /Ziaul Karim/	Date Considered 03/23/2015
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language translation is attached. **ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Z.K./**

Receipt date: 06/08/2012

13470074 - GAU: 2127

PTC/SB/05 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary) SHEET 2 OF 5	Application No.	13470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2127
	Examiner	Ziaul Karim
	Attorney Docket No.	EPACT/111C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figure Appear
	30	6,574,537	06-02-2003	Kipersztok, et al.	
	31	6,560,950	06-17-2003	Johnson	
	32	6,594,825	07-15-2003	Goldschmidtli, et al.	
	33	6,595,430	07-22-2003	Shah	
	34	6,596,058	07-22-2003	Hull, et al.	
	35	6,619,555	09-16-2003	Rosen	
	36	6,622,097	09-16-2003	Hunter	
	37	6,622,115	09-16-2003	Brown, et al.	
	38	6,622,925	09-23-2003	Carner, et al.	
	39	6,622,926	09-23-2003	Sartain, et al.	
	40	6,626,997	09-30-2003	Fox, et al.	
	41	6,633,823	10-14-2003	Bartone, et al.	
	42	6,643,567	11-04-2003	Kolk et al.	
	43	6,671,586	12-30-2003	Davis, et al.	
	44	6,695,218	02-24-2004	Flockenstein	
	45	6,725,113	04-27-2004	Guo	
	46	6,731,992	05-04-2004	Ziegler	
	47	6,734,806	05-11-2004	Cratsley	
	48	6,772,052	08-03-2004	Amundsen	
	49	6,785,592	08-31-2004	Smith	
	50	6,765,630	08-31-2004	Kolk	
	51	6,789,739	09-14-2004	Rosen	
	52	6,853,959	02-08-2005	Ireda, et al.	
	53	6,868,293	03-15-2005	Schurr	
	54	6,868,319	03-15-2005	Kipersztok, et al.	
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	56	6,869,908	05-10-2005	Crippen, et al.	
	57	6,891,838	10-10-2005	Pette, et al.	May 10, 2005
	58	6,912,429	06-2005	Bilger	

Examiner Signature /Ziaul Karim/ Date Considered 03/17/2015

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T - Place a checkmark in the box if the reference is considered pertinent to the invention. /Z.K./



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/470,074	05/11/2012	John Douglas Steinberg	EFACT.011C1	4061

7590 12/24/2015
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

EXAMINER

KARIM, ZIAUL

ART UNIT	PAPER NUMBER
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2127

NOTIFICATION DATE	DELIVERY MODE
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12/24/2015

ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 12/15/15 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

- ☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).
- ☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).
- ☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

871-272-4200 or 1-888-786-0101
 Application Assistance Unit
 Office of Data Management

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Ex** (571) 273-2885

INSTRUCTIONS: This form should be used for remitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 3 should be completed where appropriate. All further correspondence, including the Patent, Substantive Office, and Notification of Maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for remittance for mailing.

Notes: A certificate of mailing can only be used for domestic mailings of the fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmittal.

CURRENT FEE(S) TRANSMITTAL (New Use Block 1 for any unusual return)

20998 1990 09/21/2015
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Certificate of Mailing or Transmittal

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail as an envelope addressed to the Mail Stop ISSUE FEE address above, or being otherwise transmitted to the USPTO (571) 273-2885, on the date indicated below:

Deposited (date)
Registered (date)
Class (date)

APPLICATION NO.	FILING DATE	FIRST NAME(S) INVENTOR	ATTORNEY SOCIETY NO.	COMPLETION (X)
15/135,978	05/11/2013	Don Douglas Steinberg	BEACT-BUSCH	0061

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	TERM EXTENSION FEE DUE	PREV. PAST DUE FEE	TOTAL FEES DUE	DATE DUE
nonprovisional	SMALL	\$400	\$0	\$0	\$400	12/31/2015

EXAMINER	ADD UNIT	CLASS-IMPLAGE
ERIM, ZIAUL	2127	700-276000

1. Change of correspondence address as indicated in "Fee Address" (37 CFR 1.33)

☐ Change of correspondence address (or Change of Correspondent Address form PTO/SB/412) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/412, Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list:

(a) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(b) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 3 registered patent attorneys or agents. If no name is listed, no notice will be printed.

1. Knobbe, Martens

2. Olson & Bear, LLP

3. _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recording as set forth in 37 CFR 1.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE (CITY and STATE OR COUNTRY)

EcoFactor, Inc.

Redwood City, CA

Please check the appropriate assignee category or categories (will not be printed on the patent). ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s). (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2058 is attached.
☒ The director is hereby authorized to charge the payment of this fee, and deficiency, or credit any overpayment, to Deposit Account Number 15-1490 (unless an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.29
☐ Applicant changing to regular unreviewed fee status

NOTE: Attach a valid certification of Micro Entity Status (see form PTO/SB/412/USA and US6). Issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.17 and 1.33. See 37 CFR 1.4 for signature requirements and instructions.

Authorized Signature

John R. King

Date 12-15-2015

Typed or printed name John R. King

Registration No. 34,362

Docket No. EFACT.011C1

Customer No. 20995

INFORMATION DISCLOSURE STATEMENT

Inventor : John Douglas Steinberg

App. No. : 13/470,074

Filed : May 11, 2012

For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE
AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Examiner : Karim, Ziaul

Art Unit : 2127

Conf. No. : 4061

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. Copies of any listed foreign and non-patent literature references are being submitted.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after the mailing date of a final action or after the mailing date of a Notice of Allowance. Please place these references in the file in accordance with 37 CFR 1.97(i).

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12-15-2015

By: John R. King
John R. King
Registration No. 34,382
Attorney of Record
Customer No. 20,995
(849) 760-0404

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2127
SHEET 1 OF 1		Attorney Docket No. EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	8,428,785	04/23/2013	Boucher et al.	
	2	9,134,710 (EFACT.010C1)	09/15/2015	Cheung et al.	
	3	9,194,597 (EFACT.007C1)	11/24/2015	Steinberg, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	4	WO 2005/098331 A1	10/20/2005	Zip Ind Aust Pty Ltd.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

22260849:ad
121116

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

0000

T¹ - Place a check mark in this area when an English language Translation is attached.

EFACT.011C1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Douglas Steinberg
Appl. No.	: 13/470,074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ziaul Karim
Group Art Unit	: 2127

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Statement of Reasons for Allowance in the Notice of Allowance mailed September 21, 2015, Applicant respectfully submits the following comments.

Applicant respectfully disagrees with the Examiner's statement of reasons for allowance to the extent that the limitations recited by the Examiner are not present in all of the claims. Also, to the extent that there is any implication that the patentability of the claims rests on the recitation of a single feature, Applicant respectfully disagrees with the Examiner's Statement because it is the combination of features that makes the claims patentable.

Appl. No. : 13/470,074
Filed : May 11, 2012

Applicant submits that the claims of the present application are allowable because each of the claims recites a combination of features that are not taught or suggested by the prior art.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12-15-2015

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

32259214.pdf
121315

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
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20 October 2005 (20.10.2005)

PCT

(10) International Publication Number
WO 2005/098331 A1(51) International Patent Classification:
F25D 11/00, F25D 23/00(74) Agent: SPRUSON & FERGUSON, GPO Box 2598, Syd-
ney NSW 2001 (AU)(11) International Application Number:
PCT/AU2005/000151(86) Designated States (unless otherwise indicated, for every
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AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GR, GU, HK, HU, ID, IL, IN, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MY, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO,
RU, SC, SD, SE, SG, SK, SL, SM, SV, TD, TN, TR, TT, TZ,
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(22) International Filing Date: 15 March 2005 (15.03.2005)

(25) Filing Language: English

(26) Publication Language: English

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7 October 1990 6 April 2000 (05.04.2000) AU(86) Designated States (unless otherwise indicated, for every
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GM, GR, IL, IN, JP, KE, KG, KR, MA, MD, ME, MG,
MK, MN, MW, MX, MY, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SV, TD,
TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.(71) Applicant (for all designated States except US): ZIP IN-
DUSTRIES (AUST) PTY LTD [AU/AU]; 67 Allingham
Street, Concord Park, NSW 2200 (AU)

(72) Inventor(s): and

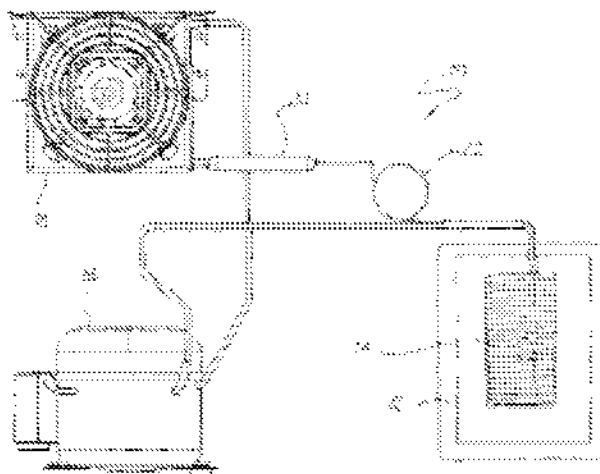
(75) Inventor(s)/Applicant(s) (for US only): CHERTOW,
Brian [ZA/AU]; 67 Allingham Road, Concord Park,
NSW 2200 (AU); PEPPIEL, Philip, Ross [AU/AU];
57 Fifth Street, Ashbury, NSW 2193 (AU); CURTIS,
Roger [GB/AU]; 7 Lawless Avenue, Ingallsdale, NSW 2133
(AU); CHICK, Steve [AU/AU]; 14012 Tindale Avenue,
Kensington, NSW 2033 (AU).

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guide
to the Symbols on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: A METHOD OF OPERATING A WATER CHILLER



(57) Abstract: A method of operating a water chiller (10) having a water tank (12), a cold water tap, and a condenser and fan (18). The chiller avoids freezing of the water in the tank (12) by switching between 'normal' and 'protection' operating modes. The switching is initially triggered by checking the length of time since the cold water tap was last operated.

WO 2005/098331 A1

A METHOD OF OPERATING A WATER CHILLER

Field of the Invention

The present invention relates to a method of operating a water chiller.

The invention has been primarily developed in relation to a combined water
5 chiller and boiling water heater unit and will be described hereinafter with reference to
this application. However, it will be appreciated that the invention is not limited to this
particular field of use and also suitable for use in a stand alone water chiller unit.

Background of the Invention

A known combined water chiller and boiling water heater unit provides instant
10 boiling and instant chilled water from a single tap. The tap is typically mounted on a
bench top or on a sink and the heater and chiller are housed together in a module,
commonly in a cupboard under the sink. The unit includes a boiling water storage tank as
well as a chilled water storage tank. An electronic controller controls both the boiling and
chiller units.

15 The chiller unit has a complete refrigeration circuit which includes a compressor,
a condenser, a fan and an evaporator. The chiller unit also has a chilled water tank with
the evaporator (ie. cooling coil) and level and temperature sensors therein.

As per any refrigeration plant, to achieve cooling, heat must be removed. The
refrigeration process involves the refrigerant being compressed through the compressor.
20 This compression also raises the temperature of the refrigerant. The refrigerant then
passes through a heat exchanger, known as a condenser, which cools the refrigerant.
Thereafter the refrigerant passes through an evaporator which allows the refrigerant to
expand causing the refrigerant to cool rapidly. This evaporator is submerged in the
chilled water tank. As the water is hotter than the refrigerant, heat is removed from the
25 water and passed into the refrigerant through the evaporator coils. The refrigerant then
passes through the compressor again and the cycle starts over.

The heat is removed through a heat exchanger condenser that is force air cooled
via an electric fan. The air is thus the cooling medium and its temperature rises. The
effect of all of this is that the ambient air temperature within the unit, and within the
30 cupboard, rises. Cupboards are often not well ventilated and as such the temperature of
ambient air in the cupboard can rise noticeably. It follows that the hotter the ambient air,
the less efficient the cooling process.

It should also be noted that water contracts in size as it cools to a temperature of 4 °C. As the water cools from 4 to 0 °C it expands again until the water is completely frozen. As water freezes the temperature remains constant at 0 °C until all the water has frozen and thereafter the temperature will continue to drop.

5 It is important that the water in the unit's chilled water tank is not allowed to freeze, as this can cause the tank to rupture.

A known approach to this issue has involved shutting down the compressor and indicating a fault if the compressor has been running continuously for one hour with no water being drawn off from the unit. This is based on the assumptions that, under normal
10 circumstances, a compressor will normally only run for 5 to 10 minutes at a time if no new water is being introduced to the tank and that one hour continuous running is insufficient to completely freeze all of the water in the tank.

Units of this type suffer from the problem that: if the cupboard is not sufficiently ventilated; the incoming ambient water temperature is high; and the unit is required to
15 work continuously due to the demands of chilled water, then this can result in the ambient air temperature inside the cupboard becoming so high that the chiller is only able to reduce the water temperature to about 7 or 8°C. Accordingly, the rate at which the unit is attempting to dissipate heat is the same rate at which the unit is absorbing heat. A state of equilibrium is thus reached and no further cooling of the water occurs. As a result, even
20 if water is not being drawn off, the compressor runs continuously and upon reaching an hour the unit indicates a fault and shuts down. This results in a service call being required, which is both a cost and a source of dissatisfaction to the user.

Object of the Invention

It is the object of the present invention to substantially overcome at least
25 ameliorate one or more of the above prior art deficiencies.

Summary of the Invention

Accordingly, in a first aspect, the present invention provides a method of operating a water chiller having: a water tank, a cold water tap, a condenser and a fan, the method including the following steps:

30 (a) monitoring a first predetermined time period since the cold water tap has been activated and if the first time period has not been reached then the chiller is said to be operating in normal mode and the method includes returning to step (a) or if the first

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time period has been reached then the chiller is said to be operating in protection mode and the method includes proceeding to step (b);

(b) determining if the compressor is on or off and if the compressor is off then proceeding to step (c) or if the compressor is on then proceeding to step (e);

5 (c) determining if a predetermined high set point temperature for the water in the tank has been reached and if the high set point has been reached then proceeding to step (d) or if the high set point has not been reached then returning to step (b);

(d) turning the compressor on then returning to step (b);

(e) determining if a predetermined low set point temperature for the water
10 in the tank has been reached and if the low set point has been reached then proceeding to step (f) and if the low set point has not been reached then proceeding to step (g);

(f) turning the compressor off, turning the fan on for a second predetermined time period and then returning to step (b);

(g) determining if a third predetermined time period has elapsed since the
15 chiller entered the protection mode and if the third time period has been reached then proceeding to step (h) and if the third time period has not been reached then returning to step (b);

(h) determining if a fourth predetermined time period has elapsed and if the fourth time period has been reached then proceeding to step (i) or if the fourth time period
20 has not been reached then returning to step (b);

(i) measuring the temperature of the water in the chiller at least three times at intervals of a fifth predetermined time period and calculating an first average temperature then proceeding to step (j);

(j) waiting for a sixth predetermined time period another then measuring
25 the temperature of the water in the chiller and calculating a second average temperature for the last at least three measurements;

(k) comparing the first and second average temperatures and if the first average temperature is less than the second average temperature then returning to step (b) or if the first temperature is equal to or more than the second average temperature then
30 proceeding to step (l);

(l) turning the compressor off and keeping the fan on then proceeding to step (m); and

(m) waiting for a seventh predetermined period of time before returning to step (b)

wherein if the cold water tap is activated when the chiller is in the protection mode then the chiller is altered to the normal mode.

The first, second, third, fourth, fifth, sixth and seventh predetermined time periods are preferably approximately 30, 5, 30, 5, 5, 5 and 30 minutes respectively.

5 The low set point and the high set point temperatures are preferably approximately 4.7 °C and 10.0 °C respectively.

Step (i) preferably includes measuring the temperature of the water in the chiller three times before calculating an average.

Brief Description of the Drawings

10 An embodiment of the invention will now be described, by way of an example only, with reference to the accompanying drawings in which:

Fig. 1 is a schematic diagram of the components of a water heater in accordance with an embodiment of the invention.

Fig. 2 is a logic diagram associated with an embodiment of a method for
15 operating a heater according to the invention; and

Fig. 3 is a further logic diagram associated with the method set out in Fig. 2.

Detailed Description of the Preferred Embodiments

Referring firstly to Fig. 1, there is shown an embodiment of a water chiller 10 in accordance with an embodiment of the present invention. The chiller 10 forms a part of a
20 combined boiling water heater and instant chilled water unit but the components of the boiling water heater are not shown for the sake of clarity.

The chiller 10 includes an insulated water tank 12 which has chilling evaporator coils 14 and a temperature sensor (not shown) therein. The tank 12 also has a cold water tap (not shown) to enable users to draw water from the tank 12. The chiller 10 also
25 includes a PCB controller (not shown), a compressor 16, a condenser and fan 18, a filter dryer 20 and a capillary tube 22. The components of the chiller 10 are arranged to operate as per a normal refrigeration cycle.

Turning now to Fig. 2, there is shown a logic diagram associated with the initial steps of operating the chiller 10 in a manner which avoids freezing of water in the tank
30 12. When the chiller 10 is operating and there is no potential risk of the water in the tank 12 freezing, it is said to be operating in a 'normal' mode, as indicated at Step 30 of Fig. 2. The controller continuously checks the length of time since the cold water tap was last

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operated, as shown in Step 32. As shown in Step 30, if the cold tap has been operated within the preceding 30 minutes, the unit continues to operate in the normal mode.

As shown in Step 34, if the cold tap has not been operated for 30 minutes or more then the chiller 10 switches to a 'protection' mode that has safeguards against freezing the water in the tank 12, as will be described below. However, as indicated at Step 36, if during any time the chiller 10 is operating in the protection mode and the cold tap is operated, it reverts to the normal mode, at Step 32, and the controller again begins checking for periods where the cold tap has not operated for 30 minutes.

The logic steps associated with the protection mode will now be described in relation to Fig. 3. As indicated at Step 40, the protection mode initially involves checking whether or not the compressor 16 is on. If the compressor 16 is not on, then the controller, as per Step 42, checks whether the water high set point temperature of 10.0 °C of the water in the tank 12 has been reached. If the water temperature is at or above 10.0 °C the compressor 16 is turned on, as indicated by Step 44, and the controller returns to Step 40 and checks whether or not the compressor 16 is on.

If the temperature of the water in the tank 12 has not reached 10.0 °C then the compressor 16 remains off and the controller returns to checking whether or not the compressor is on at Step 40.

If the compressor 16 is on then, as indicated at Step 46, the controller checks as to whether or not the water in the tank 12 has reached the low set point temperature of 4.7°C. If this is the case then, as indicated at Step 48, the compressor 16 is turned off and the fan is operated for a further 5 minutes to remove the heat soak that occurs. The controller then returns to Step 40 and continues to check whether or not the compressor 16 is on.

If the temperature of the water in the tank 12 has not reached the low set point of 4.7°C then, as indicated in Step 50, the controller checks whether or not 30 minutes has elapsed since entering the protection mode. If not, the controller returns to Step 40. If yes, then the controller proceeds to Step 52 and waits for a further 5 minutes before, at Step 54, it measures the temperature of the water in the tank 12. A new reading of the water temperature is taken every subsequent 5 minutes and, after three readings, an average of those three readings is calculated. After a further five minutes another reading is taken and the new moving average is compared to the previous average, as indicated at Step 56.

If the new average is less than the previous average it means that the chiller 10 is still chilling down and the normal operation continues. However, if the new average is the same or higher than the previous average it means that no more cooling is occurring. There are two main reasons that could lead to this occurring. The first is that the ambient
5 temperature of the air has reached a point in which the chiller 10 is operating at equilibrium and is to not to take any further heat out of the water. The second reason may be a failure of the controller or the temperature sensor probe.

Normally, as previously described in relation to Step 48, when the water is cooled to 4.7°C the compressor 16 is turned off. The cooling fan 18 then continues to run
10 for a further 5 minutes to remove the heat soak that occurs. If however the controller or the temperature sensor probe fails, the water may be continued to be cooled down past the 4.7 °C set point. If this occurs then the water starts to freeze and 0 °C and remains at this temperature until all of the water is frozen. However, the chiller 10 will recognise that the temperature is not dropping and will shut down the compressor 16 and turn on the fan
15 18, as indicated at Step 58.

As indicated at Step 60, prior to a complete freeze of the water in the tank 12, the fan 18 is kept running for 30 minutes after the compressor 16 has been shut down in order to clear any residual ambient heat in the chiller 10 and the cupboard. Thereafter, the chiller 10 returns to the normal mode of operation. Typically, the excess heat mode
20 described above may occur after the chiller 10 has been operating continuously during the day and at the end of the day when the users have departed, the cupboard is too hot for the chilled water's lower set point temperature to be reached.

The method described above advantageously allows the heat in the cupboard to be dissipated in the evening and allows the chiller 10 to cool down to the point where the
25 next day it is ready to function in the normal operating mode. Further, the controller also includes provision to supply a warning message if the overheating protection mode regularly occurs to indicate that the cupboard ventilation is inadequate and needs attention.

Although the invention has been described with reference to a preferred
30 embodiment, it will be appreciated for those skilled in the art that the invention may be embodied in many other forms.

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Claims:

1. A method of operating a water chiller having: a water tank, a cold water tap, a condenser and a fan, the method including the following steps:
 - 5 (b) monitoring a first predetermined time period since the cold water tap has been activated and if the first time period has not been reached then the chiller is said to be operating in normal mode and the method includes returning to step (a) or if the first time period has been reached then the chiller is said to be operating in protection mode and the method includes proceeding to step (b);
 - 10 (b) determining if the compressor is on or off and if the compressor is off then proceeding to step (c) or if the compressor is on then proceeding to step (e);
 - (c) determining if a predetermined high set point temperature for the water in the tank has been reached and if the high set point has been reached then proceeding to step (d) or if the high set point has not been reached then returning to step (b);
 - 15 (d) turning the compressor on then returning to step (b);
 - (e) determining if a predetermined low set point temperature for the water in the tank has been reached and if the low set point has been reached then proceeding to step (f) and if the low set point has not been reached then proceeding to step (g);
 - (f) turning the compressor off, turning the fan on for a second
 - 20 predetermined time period and then returning to step (b);
 - (g) determining if a third predetermined time period has elapsed since the chiller entered the protection mode and if the third time period has been reached then proceeding to step (h) and if the third time period has not been reached then returning to step (b);
 - 25 (h) determining if a fourth predetermined time period has elapsed and if the fourth time period has been reached then proceeding to step (i) or if the fourth time period has not been reached then returning to step (b);
 - (i) measuring the temperature of the water in the chiller at least three times at intervals of a fifth predetermined time period and calculating an first average
 - 30 temperature then proceeding to step (j);
 - (j) waiting for a sixth predetermined time period another then measuring the temperature of the water in the chiller and calculating a second average temperature for the last at least three measurements;

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- (k) comparing the first and second average temperatures and if the first average temperature is less than the second average temperature then returning to step (b) or if the first temperature is equal to or more than the second average temperature then proceeding to step (l);
- 5 (l) turning the compressor off and keeping the fan on then proceeding to step (m); and
- (m) waiting for a seventh predetermined period of time before returning to step (b)
- wherein if the cold water tap is activated when the chiller is in the protection
- 10 mode then the chiller is altered to the normal mode.
2. The method as claimed in claim 1, wherein the first, second, third, fourth, fifth, sixth and seventh predetermined time periods are approximately 30, 5, 30, 5, 5, 5 and 30 minutes respectively.
3. The method as claimed in claim 1 or 2, wherein the low set point and the high set
- 15 point temperatures are approximately 4.7 °C and 10.0 °C respectively.
4. The method as claimed in claim 1, 2 or 3, wherein step (i) includes measuring the temperature of the water in the chiller three times before calculating an average.

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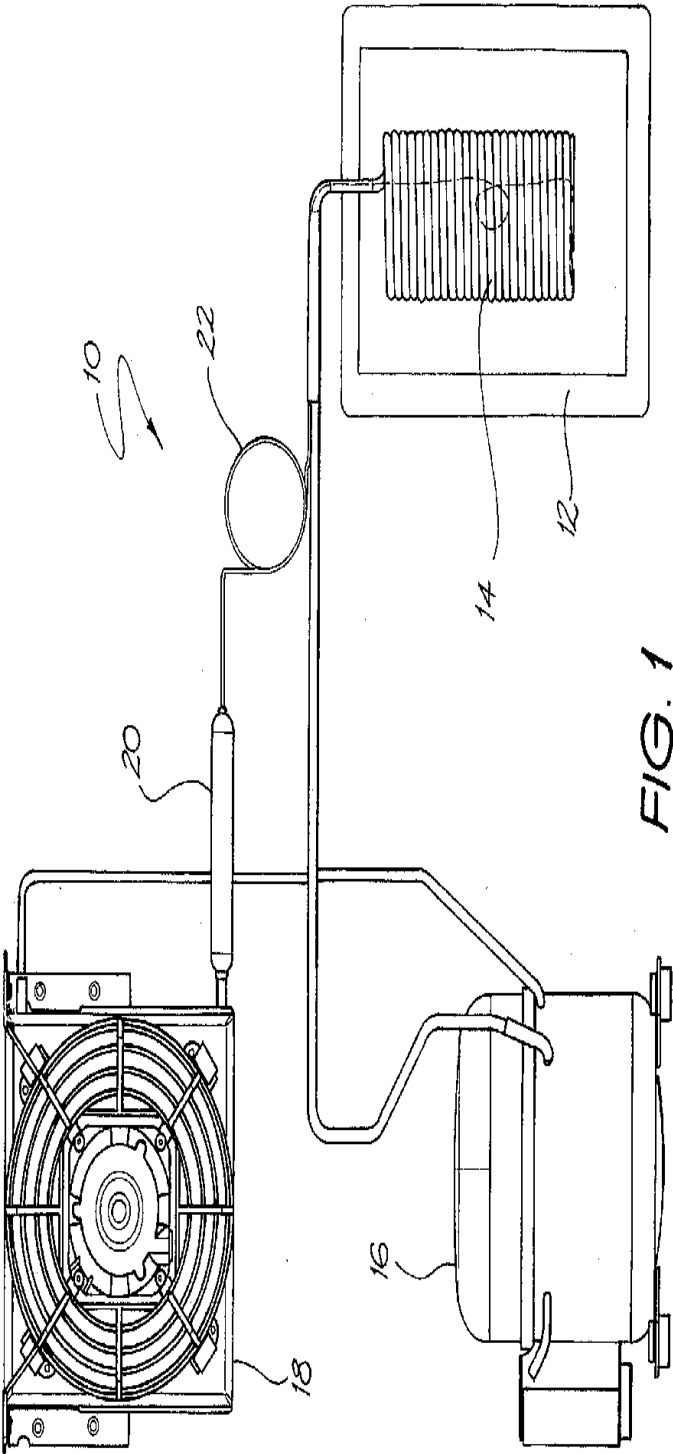
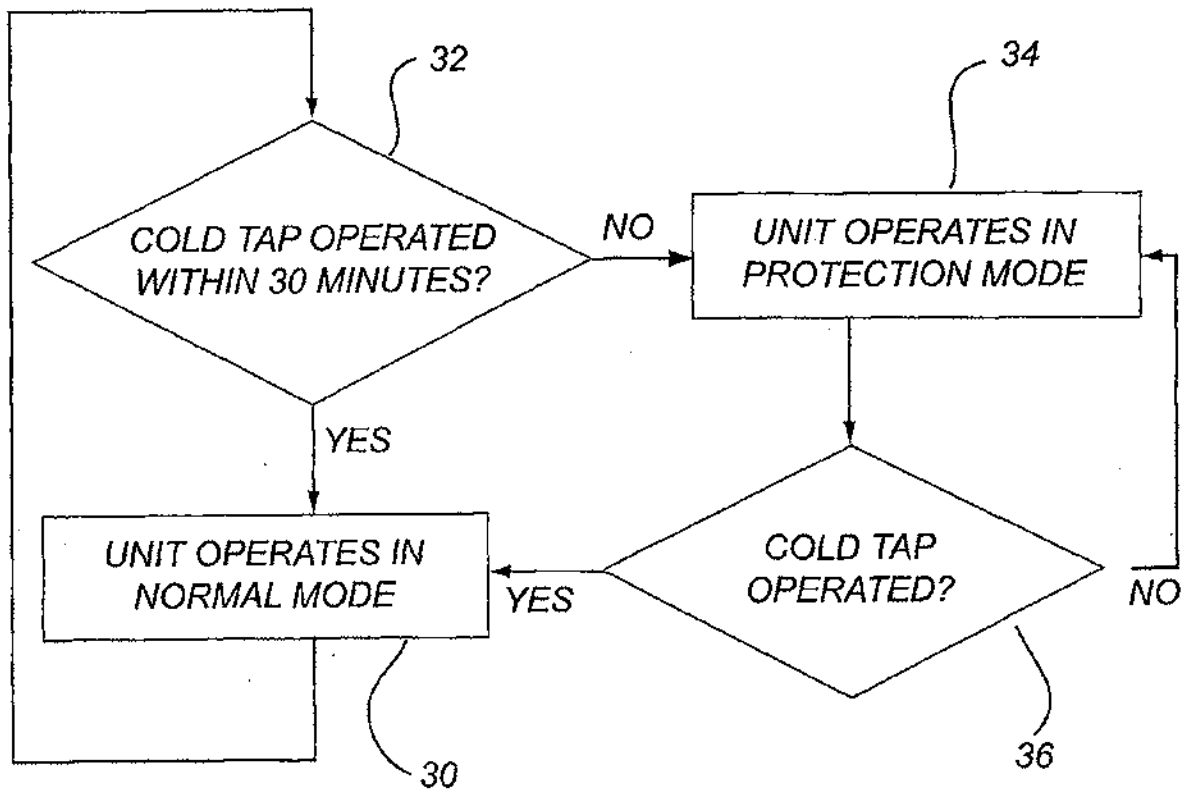


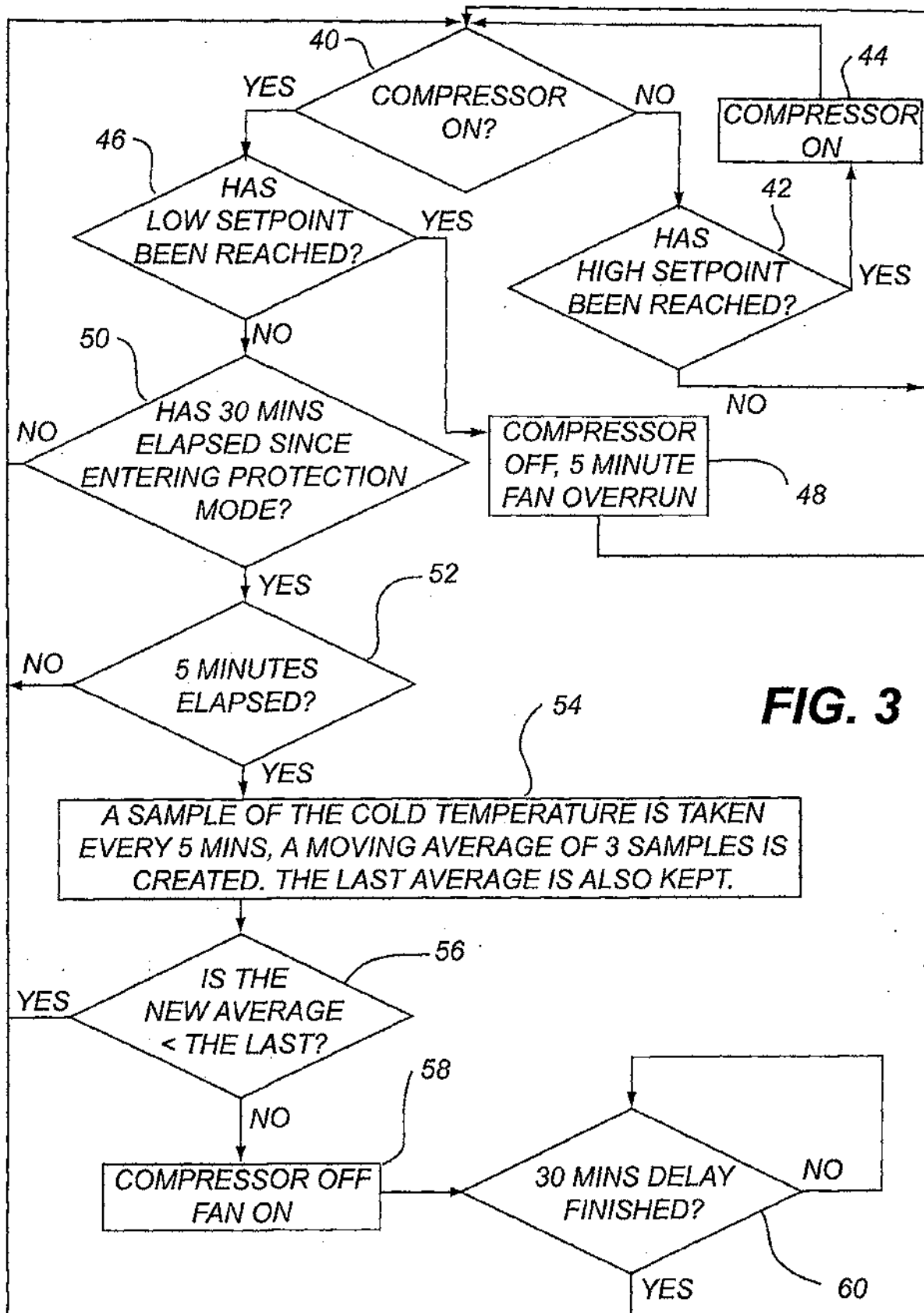
FIG. 1

**FIG. 2**

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**FIG. 3**

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/000361

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁸ F25B 49/02; F25D 11/00, 13/00, 29/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation, to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
DWPI: F25B/IC; F25B 49/02; F25D 11/00, 13/00, 29/00 & keywords - freezer, water chill+		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Classification of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2001/079733 A (ZIP HEATERS (AUSTRALIA) PTY LIMITED) 23 October 2001 Whole document	1-4
A	EP 0967449 A (DANFOSS A/S) 29 December 1999 Whole document	1-4
A	US 5724355 A (SO et al) 6 July 1998 Whole document	1-4
A	Patent Abstracts of Japan, JP 2002-313050 A (MIURA CO LTD) 31 October 2002 Abstract	1-4
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents:		
"X" document disclosing the general state of the art which is not considered to be of particular relevance	"Y" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"W" earlier application or patent but published at or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"I" document which may have priority date or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is considered with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"Z" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date		
Date of the actual completion of the international search	Date of mailing of the international search report	
10 May 2005	15 May 2005	
Name and mailing address of the ISA/AU	Authorized officer	
AUSTRALIAN PATENT OFFICE PO BOX 200, WOTEN ACT 2006, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6263 1929	Thara Fernando Telephone No. (02) 6263 2486	

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2005/000361

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
WO	2001079733	AU	48148/01		
EP	0967449	BR	9903275	CN	1240924 US 6138465
US	5224355	JP	2539569	KR	9402232
JP	2002318050	NONE			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
END OF ANNEX					

Electronic Patent Application Fee Transmittal

Application Number:	13470074			
Filing Date:	11-May-2012			
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				480

Electronic Acknowledgement Receipt

EFS ID:	24366456
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Chelsea Burdeno
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	15-DEC-2015
Filing Date:	11-MAY-2012
Time Stamp:	17:25:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$480
RAM confirmation Number	4679
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	EFACT-011C1_issuefee.pdf	156893	no	1
			2da5e6a0e7911c33004d762197a53679		
Warnings:					
Information:					
2		EFACT-011C1_IDS.pdf	121686	yes	2
			13a21f9e2256107e2d1542651680a91a4e4e4		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	EFACT-011C1_comments.pdf	87799	no	2
			ae61092329f5dbw8e0c5d810c90083c75d2f70ex.d		
Warnings:					
Information:					
4	Foreign Reference	EFACT-011C1_ref.pdf	608437	no	14
			9f53130e9f2e30ae790e517e33e2352e0da301e		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30593	no	2
			9f92968a2e0d6a0d95e8a2f6e619d2e3e9f65096		
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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EFACT.011C1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	: John Douglas Steinberg
App. No.	: 13/470,074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Karim, Ziaul
Art Unit	: 2127
Conf. No.	: 4061

SUPPLEMENTAL AMENDMENT

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Summary of Interview begins on page 6 of this paper.

Remarks/Arguments begin on page 7 of this paper.

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- ☐ Standards (10)

Year

Single Year

Range

From To

Author

Affiliation

Publication Title

Publisher

Conference Location

Standard Status

☐ **An investment decision support tool for horticulture with an adaptive energy management system**

Trauthichaphat, W.; Kittipiyakul, S.; Kaumarungsri, K.; Isshiki, T.
Information and Communication Technology for Embedded Systems (ICT-ICTES), 2015 6th International Conference of
Year: 2015
Pages: 1 - 6, DOI: 10.1109/ICTEmSys.2015.7110320
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☐ **Ambient Use-Condition Models for Reliability Assessment**

Chen Gu, Kwasnick, R.F., Mielke, N., Monroe, E.M., Shirley, G.
Reliability Physics Symposium Proceedings, 2006. 44th Annual, IEEE
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Pages: 299 - 306, DOI: 10.1109/RELPHY.2006.251232
Cited by: Papers (4)
IEEE Conference Publications

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☐ **Model-based control on populations of air conditioners: Shaping aggregated power for demand side management**

Perfunio, C.; Kofman, E.; Braslavsky, J.H.; Ward, J.K.
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Local Computer Networks Workshops (LCN Workshops), 2013 IEEE 38th
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Instrumentation and Measurement, IEEE Transactions on

distributed primary
transformer

bus

protocol

failure

remote control

impulsive noise

electromagnetic

compatibility (emc)

shunt reactor

control switchboard

ambient air

temperature

benchmark

conformance tests

design tests

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Year: 1982, Volume: IM-31, Issue: 3
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Abstract (1270 Kb)

☐ **Design and implementation of a fuzzy logic based controller for refrigerating systems**

Rashid, M.M.; Islam, A.
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 Year: 2010
 Pages: 1 - 5, DOI: 10.1109/ICCCCE.2010.5556548
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Haider, Z.; Mehmood, F.; Xiaohong Guan; Jiang Wu; Yang Liu; Bhan, P.
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 Year: 2015
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Cleveland, M.A.; Schuh, J.M.
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 Year: 2015
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☐ **Intelligent climate control in outdoor cellular radio bases**

Larsson, T.
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 Year: 1995
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Year: 2005

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☐ **A Time-Domain Sub-Micro Watt Temperature Sensor With Digital Set-Point Programming**

Poki Chen; Tuo-Kuang Chen; Yu-Shin Wang; Chen, Chun-Chi

Sensors Journal, IEEE

Year: 2009, Volume: 9, Issue: 12

Pages: 1639 - 1646, DOI: 10.1109/JSEN.2009.2029035

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☐ **Peak load reduction by using air-conditioning regulators**

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Electrotechnical Conference, 2008. MELECON 2008. The 14th IEEE Mediterranean

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Blinov, Y.; Puzniak, I.; Shalunov, A.; Pechenkov, A.; Zuev, A.

EUROCON 2009, EUROCON '09, IEEE

Year: 2009

Pages: 1611 - 1614, DOI: 10.1109/EURCON.2009.5167558

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Abstract (150 Kb)

☐ **Boundary Estimation in the Inverse Natural Convection Problems**

Meel-Jy Shiao; Ching-Yu Yang

Innovative Computing, Information and Control, 2007. ICICIC '07. Second International Conference on

Year: 2007

Pages: 447 - 447, DOI: 10.1109/ICICIC.2007.200

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Abstract (180 Kb)

☐ **Research and Application on GA-Based Two-Stage Fuzzy Temperature Control System for a Type of Industrial Furnace**

Peng Xiechong; Mo Zhi; Xiao Laisheng

Electrical and Control Engineering (ICECE), 2010 International Conference on

Year: 2010

Pages: 1555 - 1561, DOI: 10.1109/ICECE.2010.354

Cited by: Papers (2)

IEEE Conference Publications

Abstract (330 Kb)

☐ **Detuning minimization for alternative energy vehicular drive system**

0035

Optimization
Vehicle Power and Population Constraints (VPPC), 2012 IEEE
Year: 2012
Pages: 42 - 47, DOI: 10.1109/VPPC.2012.6422851
IEEE Conference Publications

Abstract: 100% Key

Investigation of the Distribution of the temperature field in high temperature and high humidity caving face

Li, Guorui; Guo, Fei; Guo, Yuesi; Li, Xingqiang
Computational Intelligence and Industrial Applications, 2009. PACIA 2009
Asia-Pacific Conference on
Year: 2009, Volume: 1
Pages: 408 - 412, DOI: 10.1109/PACIA.2009.5307484
IEEE Conference Publications

Abstract: 400% Key

Adaptive Intelligent Controller for Household Cooling Systems

Chen, P.; Chaitinajee, G.; Batta, S.
Integrated Intelligent Computing (IIC), 2010 First International Conference on
Year: 2010
Pages: 98 - 101, DOI: 10.1109/IIC.2010.54
IEEE Conference Publications

Abstract: 100% Key

Numerical simulation of welding deformation under different conditions

Chen, Li; Dong, Wang
Computing, Control and Systems Engineering (CCSE), 2011 IEEE 2nd
International Conference on
Year: 2011, Volume: 2
Pages: 402 - 405, DOI: 10.1109/CCENG.2011.6091149
IEEE Conference Publications

Abstract: 100% Key

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manufacturer of electronic locks for hotels—also talk to a motion sensor in the room to sense ... setback limits, and room occupancy status for hotel employees so as not to disturb guests.

Handbook of Air Conditioning and Refrigeration



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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	0	(occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and (determin\$4 near (web or internet)) with activity	US-PGRUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/08/26 09:46
L3	0	(occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and (determin\$4 near20 (web or internet)) with activity	US-PGRUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/08/26 09:46
L4	137	(occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and ((internet or audio or video) near20 us\$3)	US-PGRUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/08/26 10:21
L5	70	(occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and ((internet or audio or video) near20 us\$3)	US-PGRUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/08/26 10:21
S1	102	((John) near2 (Steinberg)).INV.	US-PGRUB; USPAT	OR	OFF	2015/03/16 12:28
S2	220	("6574537" "6619855" "6622926" "6633823" "6643567" "20090125151" "20090046105" "20090052858" "20100156808" "7242988" "4106732" "5270952" "5314004" "7864943" "5572438" "5717609" "8698856" "5977964" "7260823" "5655827" "20100289643" "7585225" "7802618" "20100182255" "5462225" "20110031323" "20070045431" "20100019051" "4403644" "6400996" "6595430" "6622925" "20090099699" "20070148128" "5882949" "20090099699" "20090281667" "5261481" "7354005" "6351893" "6480803" "6626997" "20060281472" "4855279" "5816347" "20100070069" "20100070099" "20100211224"	US-PGRUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/03/16 12:30

		"20100235004" "20080263621" "4674027" "6145751" "6437692" "7483964" "H002176" "5544036" "7055759" "7846900" "6548130" "8594825" "5022037" "7844809" "20090240381" "20100070086" "7366384" "5761083" "6178562" "8506875" "8542076" "6871588" "8912429" "7061393" "20090125151" "4341345" "5244146" "9260765" "20100019052" "7754794"), PN.				
S3	4	S2 and rosen.in.	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:31
S4	1	S2 and rosen.in. and override	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:32
S5	0	"11335182" app.	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:32
S6	2	(11/335182) app.	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:33
S7	2	S6 and override	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:33
S8	0	S6 and override and occup%4	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:35
S9	2	S6 and override and occup54	US-PGPUB, USPAT, USOCR, FPRS, EPO, JPO, DERWENT, IBM, TDS	OR	OFF	2015/03/16 12:35

S10	2	\$6 and override and occup\$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/03/16 12:35
S11	2	\$6 and override and occup\$5 and ((user or operator) same (input or prompt\$4 or ask))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/03/16 12:36
S12	2	\$6 and override and occup\$5 and ((user or operator) same (input or prompt\$4 or ask\$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/03/16 12:36
S13	1745664	(temperature or thermostat or HVAC) or heating or cooling) with (control\$4 or setting or set \$1point)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 12:37
S14	22903	S13 and (temperature near (set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 12:42
S15	460	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 12:43
S16	413	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 12:44
S17	47	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near\$20 (set adj point or setpoint)) with temperature	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 12:45
S18	16	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near\$20 (set adj point or setpoint)) with	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2015/03/16 12:45

		temperature and server	DERWENT; IBM, TDS			
S19	18	S12 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 12:45
S20	18	(temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:31
S21	18	(temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5 and HVAC	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:31
S22	0	"20080281472"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:35
S23	0	((Cliff near2 Federsple)) inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:36
S24	0	((Cliff) near2 (Federsple)) inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:40
S25	0	((Federsple) near2 (Cliff)) inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/03/16 14:40
S26	982	HVAC and (temperature near (set adj point or setpoint))	USPAT	OR	OFF	2015/03/16 19:07
S27	2719	HVAC and (temperature near (set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	OFF	2015/03/16 19:07

S28	3071	HVAC and (temperature near (set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:07
S29	668	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:08
S30	215	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:09
S31	183	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj interface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:09
S32	169	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj interface) and thermostat	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:09
S33	169	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj interface) and thermostat and (user near\$20 interface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:10
S34	102	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj interface) and thermostat and (user near\$20 interface) and (remote near control\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:10
S35	52	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj interface) and thermostat and (user near\$20 interface) and (remote near control\$4) and ((cell or wireless) near\$10 phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:11
S36	4	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near\$ sensor\$1) and ((wireless or WIFI) near network) and (GUI or user adj	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/03/16 19:11

		interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	EPO; JPO; DERWENT; IBM_TDS			
S37	9	"7663775"	US-PGPUB; OR USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/16 22:09
S38	4671	(G05G23/1902 or F24F11/0078 or F24F11/0034 or F24F2011/0075) opo	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:21
S39	3	S36 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:21
S40	3	S36 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:22
S41	11	S36 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:23
S42	18457	700/276-296 cols.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:24
S43	28	S42 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/03/17 11:24

		((setpoint or set adj point) near10 input)				
S44	1	236/49.3.cds. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:25
S45	3	236/51.cds. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:26
S46	3	"20110202181"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:29
S47	8	"8386062"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:30
S48	3	"20080167756"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 13:58
S49	105	((John) near2 (Stenberg)).INV.	US-PGPUB; USPAT	OR	OFF	2015/07/23 17:23
S50	4	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/20 17:23
S51	3	(G05U23/1902 or F24F11/0078 or F24F11/0034 or F24F2011/0075) cps. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/20 17:24

		(user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)				
SE2	1	236/49.3.cels. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:25
SE3	4	236/51.cels. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:25
SE4	5079	(G05D23/1902 or F24F11/0076 or F24F11/0034 or F24F2011/0075) ops	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:25
SE5	3	SE4 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:25
SE6	4	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:25
SE7	56	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:27
SE8	39	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near20 message)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/07/29 17:28

			IBM, TDS			
S69	39	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:28
S60	28	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:28
S61	0	(HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device)) cin.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:28
S62	0	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device) and (chang\$3 near (set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:29
S63	16	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device) and (chang\$3 near2(set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:30
S64	16	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device) and (chang\$3 near2(set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:30
S65	16	HVAC and (temperature near (set adj point or setpoint)) and (specific near (audio or video)) and (send\$3 near message) and (wireless near device) and (chang\$3 near2 (set adj point or setpoint))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:30
S66	499	HVAC and (vary\$3 near temperature)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM, TDS	OR	ON	2015/07/29 17:31
S67	76	HVAC and (vary\$3 near temperature) and (temperature near setpoint)	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/07/29 17:32

			EPO; JPO; DERWENT; IBM_TDS			
S68	52	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:32
S69	0	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:33
S70	30	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:33
S71	15	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:33
S72	12	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:33
S73	6	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:33
S74	1	HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure) and (activity near status)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:43
S75	1	(G05D23/1002 or F24F11/0076 or F24F11/0034 or F24F2011/0075).ipc and HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure) and (activity near status)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29 17:51
S76	0	("20040117330" "20090065596"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	ON	2015/07/29

		"20150025691" "8700224" "20130173064" "20040133314" "5348074" "7889907" "8550348" "9057649" "20140316581" "20150120235" "7206670" "20130178985"). FN. and HVAC and (vary\$3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure) and (activity near status)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS			18:17
S79	214	((occupan\$3 near20 deter\$5) and (HVAC near temperature)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:28
S80	25	((occupan\$3 near20 deter\$5) and (HVAC near temperature) and (determin\$3 near (setpoint or set adj point))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:38
S81	267	((occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:40
S82	239	((occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and (computer or laptop or PDA or Iphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:41
S83	0	((occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and (determin\$4 near (web or internet)) with activity	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:43
S84	0	((occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and ((determin\$4 near (web or internet)) with (use or activity))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:43
S85	0	((occupan\$3 near20 deter\$5) and (HVAC near20 temperature) and (determin\$3 near20 (setpoint or set adj point)) and ((determin\$4 near20 (web or internet)) with (use or activity))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDS	OR	OFF	2015/07/30 14:43


S86	2	"20120221151"	US-PGPUB; USPAT; USDOC; FIRS; EPO; JPO; DERWENT; ISM; TDS	OR	OFF	2015/07/30 15:12
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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	HVAC and (varyS3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure) and (activity near status)	US-PGPUB; USPAT; UPAD	OR	ON	2015/08/26 09:45
S78	1	(G05D23/1802 or F24F11/0076 or F24F11/0034 or F24F2011/0075) cpc. and HVAC and (varyS3 near temperature) and (temperature near setpoint) and ((user near interface) or GUI) and (wireless near device) and (audio or video) and (occupant near structure) and (activity near status)	US-PGPUB; USPAT; UPAD	OR	ON	2015/07/28 17:51

8/28/2015 11:43:39 AM

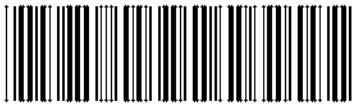
C:\Users\zkarim\Documents\EAST\Workspaces_13470074.wsp

Issue Classification 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner ZIAUL KARIM	Art Unit 2127

[illegible]

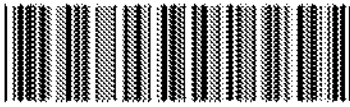
CPC Combination Sets							
Symbol				Type	Set	Ranking	Version

/ZIAUL KARIM/ Examiner.Art Unit 2127		07/29/2015	Total Claims Allowed:	
(Assistant Examiner)		(Date)	18	
/MOHAMMAD ALI/ Supervisory Patent Examiner.Art Unit 2127		09/08/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)		(Date)	1	1

Issue Classification 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner ZIAUL KARIM	Art Unit 2127

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION									
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED				
700			276												
CROSS REFERENCE(S)															
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)														

/ZIAUL KARIM/ Examiner, Art Unit 2127 (Assistant Examiner)	07/29/2015 (Date)	Total Claims Allowed: 18	
/MOHAMMAD ALI/ Supervisory Patent Examiner, Art Unit 2127 (Primary Examiner)	09/08/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner ZIAUL KARIM	Art Unit 2127

<input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant																<input type="checkbox"/> CPA		<input type="checkbox"/> T.O.		<input type="checkbox"/> R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original						
	1		13																		
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ZIAUL KARIM Examiner, Art Unit 2127 (Assistant Examiner)	07/29/2015 (Date)	Total Claims Allowed: 15	
MOHAMMAD ALI Supervisory Patent Examiner, Art Unit 2127 (Primary Examiner)	08/08/2015 (Date)	C.G. Print Claim(s) 1	C.G. Print Figure 1



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

2019/5 7500 09/21/2015
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

EXAMINER

KARIM ZIAUL

ART UNIT

PAPER NUMBER

2127

DATE MAILED: 09/21/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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13/470,074

05/11/2012

John Douglas Steinberg

EFFECTO11C1

4061

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPLX. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	12/21/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

20095 7590 09/21/2015
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/470,074	05/11/2012	John Douglas Steinberg	EE/ACTE011C1	4061

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	12/21/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
KARIM, ZIAUL	2127	700-276000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
- 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature

Date

Typed or printed name

Registration No.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/470,074	05/11/2012	John Douglas Steinberg	1EACT.011C1	4061
20095 7500 09/21/2015 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER KARIM, ZIAUL	
			ART UNIT	PAPER NUMBER
			2127	
DATE MAILED: 09/21/2015				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 C.F.R. 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 C.F.R. 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 C.F.R. 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 C.F.R. 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13-476,074	STENBERG, JOHN DOUGLAS	
	Examiner	Art Unit	
	ZIAUL KARIM	2127	

All participants (applicant, applicant's representative, PTO personnel):

(1) ZIAUL KARIM (3) _____

(2) John R. King (reg. 34, 362) (4) _____

Date of interview: 25 August 2015

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No
 If Yes, brief description: _____

Issues Discussed: ☒ 101 ☒ 112 ☐ 102 ☐ 103 ☐ Others
 (For each of the checked box(es) above, please describe below the issue and detailed descriptions of the discussion.)

Claim(s) discussed: 1 and 12

Identification of prior art discussed: _____

Substance of Interview
 (For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references, etc.)

Examiner initiated the call because claims submitted on July 23rd 2015 had 101 and 112 issue. Examiner explained that there are couples of 112 and 101 issues. Applicant's representative agreed and decided to fix it. Applicant's representative decided to file supplemental amendment correcting 101 and 112 issue.

Applicant recordation instructions It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.03 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

ZIAUL KARIM Examiner, Art Unit 2127	MOHAMMAD ALI Supervisory Patent Examiner, Art Unit 2127
--	--

Notice of Allowability

Application No.

10/470,074

Examiner

ZIAUL KARIM

Applicant(s)

STEINBERG, JOHN DOUGLAS

Art Unit

2127

AsA (First Invention to
File) Status

No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL 85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/23/2015.
☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) herein 1-18. As a result of the allowed claim(s), you may be eligible to benefit from the Patent Prosecution Highway program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patent/pat_events/ptph/ptphs.asp or send an inquiry to PPHFeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:a) ☐ All b) ☐ Some c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in **ABANDONMENT** of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ **CORRECTED DRAWINGS** (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
 Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ **DEPOSIT OF and/or INFORMATION** about the deposit of **BIOLOGICAL MATERIAL** must be submitted. Note the attached Examiner's comment regarding **REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL**.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SF/08).
 Paper No./Mail Date 07/23/2015
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413).
 Paper No./Mail Date 08/25/2015
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____

/MOHAMMAD ALI/
 Supervisory Patent Examiner, Art Unit 2127

Application/Control Number: 13/470,074
Art Unit: 2127

Page 2

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Claims 1-18 are pending.

Claims 1 and 10 are independent.

Applicant's supplemental amendment and argument's filed on 08/31/2015 has been entered.

Allowable Subject Matter

Claims 1-18 are allowable over prior art of record.

The following is an examiner's statement of reasons for allowance:

After a thorough search, examination, persuasive amendment and arguments and in light of the prior art made of record, claims 1-18 are allowed.

The prior art of record does not teach or fairly suggest in combination of steps as recited in the Applicant's independent claims as amended.

The dependent claims, being definite, further limiting, and fully enabled by the specification are also allowed.

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany

Application/Control Number: 13/470,074

Page 3

Art Unit: 2127

the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZIAUL KARIM whose telephone number is (571)270-3279. The examiner can normally be reached on Monday-Thursday 8:00-4:30 PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571 272 4105. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ZIAUL KARIM/

Examiner, Art Unit 2127

/MOHAMMAD ALI/

Supervisory Patent Examiner, Art Unit 2127

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13-476,074	STENBERG, JOHN DOUGLAS	
	Examiner	Art Unit	
	ZIAUL KARIM	2127	

All participants (applicant, applicant's representative, PTO personnel):

(1) ZIAUL KARIM (3) _____

(2) John R. King (reg. 34, 362) (4) _____

Date of interview: 25 August 2015

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No
 If Yes, brief description: _____

Issues Discussed: ☒ 101 ☒ 112 ☐ 102 ☐ 103 ☐ Others
 (For each of the checked box(es) above, please describe below the issue and detailed descriptions of the discussion.)

Claim(s) discussed: 1 and 12

Identification of prior art discussed: _____

Substance of Interview
 (For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references, etc.)


Examiner initiated the call because claims submitted on July 23rd 2015 had 101 and 112 issue. Examiner explained that there are couples of 112 and 101 issues. Applicant's representative agreed and decided to fix it. Applicant's representative decided to file supplemental amendment correcting 101 and 112 issue.

Applicant recordation instructions It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.03 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

ZIAUL KARIM Examiner, Art Unit 2127	MOHAMMAD ALI Supervisory Patent Examiner, Art Unit 2127
--	--

Search Notes 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner ZIAUL KARIM	Art Unit 2127

CPC- SEARCHED		
Symbol	Date	Examiner
G05D23/1902	3/17/2015	ZK
updated CPC search	7/29/2015	ZK

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
F24F11/0076	3/17/2015	ZK
F24F11/0034	3/17/2015	ZK
F24F2011/0075	3/17/2015	ZK
updated CPC search	7/29/2015	ZK

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
700	276-298	3/17/2015	ZK
236	49.3, 51	3/17/2015	ZK
	updated calss/subcalss search	7/29/2015	ZK

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search, Assignee search	3/17/2015	ZK
Google search, IP.com search	3/17/2015	ZK
East search	3/17/2015	ZK
updated assignee search, Inventor name search, Google search and IEEE search	7/29/2015	ZK

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	US-PGPUB, UPAD and USPAT text search, see interference search printout.	7/29/2015	ZK

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Figure 1. The effect of the concentration of the *Agaricus bisporus* spores on the growth of *Agaricus bisporus* and *Agaricus bisporus* spores.

2000

.....

- System Date Range

.....

Figure 1. Schematic diagram of the experimental setup. The subject was seated at a distance of 60 cm from the screen. The screen displayed a target area (red circle) and a starting point (black dot). The subject's hand was positioned at the starting point. The screen also displayed a scale bar indicating the distance between the starting point and the target area.

... the two stages of the system are applied. Some such as Highway construction and maintenance are not ... working with the system interface into the total transportation system for the ordinary a more complete understanding of the system can be obtained by using the

ANTHONY RELAY IN (W/IT THE WIRELESS), OCCUPANCY MONITOR, SENSOR
 INDEPENDENT SENSOR AND (W/IT THE WIRELESS) - BUT THE CLASS (W/IT THE WIRELESS)
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[illegible][illegible][illegible][illegible]

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The word obscurely is used to describe the subject in the paragraph being studied in paragraph ... Generally, authors have been encouraged to write in an obscure style ... This represents the presentation of that particular language, words, and ideas ... therefore the words obscurely, obscurely, obscurely, obscurely, obscurely are

.....

The new processor ranges the spectrum of the processor so as to reduce the storage ... that requires the presentation of the structural images, data and ideas. Therefore, the new processor requires a system, which is able to ... effectively search, collect, produce, and disseminate and actively store information.

.....

[illegible]

.....

11. What design and security controls at Best Buy are used when connecting to external sites and when using mobile devices and applications?

[illegible]

These products are made on design and construction for the
and are made in a standard and uniform design. They are
strong, long lasting, and are made with high quality material.

1. *What is the purpose of this study?*
 2. *What are the research questions?*
 3. *What are the hypotheses?*
 4. *What are the variables?*
 5. *What is the research design?*
 6. *What are the data sources?*
 7. *What are the data collection methods?*
 8. *What are the data analysis methods?*
 9. *What are the results?*
 10. *What are the conclusions?*
 11. *What are the implications?*
 12. *What are the limitations?*
 13. *What are the future research directions?*
 14. *What are the references?*
 15. *What are the appendices?*
 16. *What are the glossary?*
 17. *What are the acknowledgments?*
 18. *What are the funding sources?*
 19. *What are the ethical considerations?*
 20. *What are the contact information?*

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

1. *What is the purpose of the study?*
 2. *What are the research objectives?*
 3. *What is the research design?*
 4. *What are the variables?*
 5. *What are the hypotheses?*
 6. *What are the results?*
 7. *What are the conclusions?*
 8. *What are the limitations?*
 9. *What are the implications?*
 10. *What are the future research directions?*

Don't Know

Investment: 2000 (European Investment Bank)
 & 2001 (European Investment Bank)
 Production: 2000 (European Investment Bank)
 & 2001 (European Investment Bank)

1. The first step is to identify the problem or question that needs to be answered.



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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary)	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2127
	Examiner	Karim, Ziaul
SHEET 1 OF 1	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	12/805705	06/10/2010	Crabtree	
	2	13/729401	12/28/2012	Sloop	
	3	14/731,221	06/04/2015	Steinberg, et al.	
	4	5,348,078	09/20/1994	Dushane et al.	
	5	6,700,224	03/02/2004	Biskup, Sr.,	
	6	7,206,670	04/17/2007	Pimputkar, et al.	
	7	7,869,904	01/11/2011	Cannon et al.	
	8	8,850,348	09/30/2014	Fadell et al.	
	9	9,057,649 (EFACT.006C2)	06/16/2015	Steinberg, et al.	
	10	2013/0173064	07/04/2013	Fadell et al.	
	11	2013/0178985	07/11/2013	Lombard et al.	
	12	2014/0316581	10/26/2014	Fadell et al.	
	13	2015/0025691	01/22/2015	Fadell et al.	
	14	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
	15	2015/0168001 (EFACT.012C2)	06/18/2015	Steinberg	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

21157086:ad
071715

Examiner Signature /Ziaul Karim/	Date Considered 07/29/2015
----------------------------------	----------------------------

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Z.K./

T¹ - Place a check mark in this area when an English language translation is attached.

EFACT.011C1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	: John Douglas Steinberg
App. No.	: 13/470,074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Karim, Ziaul
Art Unit	: 2127
Conf. No.	: 4061

SUPPLEMENTAL AMENDMENT

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Summary of Interview begins on page 6 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Application No.: 13/470,074

Filing Date: May 11, 2012

AMENDMENTS TO THE CLAIMS

Please see the proposed amendments to Claims 1, 9, 10, and 18 as indicated below.

1. (Proposed Amendment) A method for varying temperature setpoints for ~~an HVAC a heating ventilation and air conditioning (HVAC)~~ system comprising:

storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated with said structure deemed to be occupied;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that ~~the~~ specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by at least one ~~a~~ specific occupant ~~or occupants~~ of said structure;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

determining that said at least one ~~or more~~ specific occupant ~~occupants~~ has previously indicated a preference that ~~said specific occupant's~~ input be obtained before automatically changing said current HVAC temperature setpoint in response to said activity status;

prompting said at least one ~~or more users~~ specific occupant based on said determining that said ~~one or more of said user's~~ input should be obtained, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

Application No.: 13/470,074

Filing Date: May 11, 2012

in response to said prompting, receiving said input from said at least one or more users specific occupant; and

keeping said current HVAC temperature setpoint based upon said input from said at least one or more users specific occupant.

2. (Original) The method of Claim 1 wherein said wireless device is a remote control.

3. (Original) The method of Claim 1 wherein said wireless device is a wireless phone.

4. (Original) The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. (Previously Presented) The method of Claim 1 wherein said wireless device is a tablet computer.

6. (Original) The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server.

7. (Original) The method of Claim 1 in which said wireless device communicates with a remote server.

8. (Original) The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. (Proposed Amendment) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said at least one or more users specific occupant.

10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the presence of one or more occupants in said structure;

Application No.: 13/470,074

Filing Date: May 11, 2012

at least one wireless device associated with said one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

an application comprising one or more computer processors in communication with a storage medium comprising computer accessible memory, the application that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied,

said application determining a probability that ~~the specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by a~~ at least one specific occupant ~~or occupants of said structure;~~

said application determining that said at least one specific occupant ~~one or more users~~ has previously indicated a preference that ~~said user's~~ input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device;

said application prompting said at least one specific occupant ~~one or more users~~ based on said determining that said ~~one or more of said user's~~ input should be obtained,

wherein said application provides electronic notice to said at least one specific occupant ~~one or more of said users~~ of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and

wherein said application in response to said prompting, receives said input from said at least one specific occupant ~~one or more users~~; and

Application No.: 13/470,074

Filing Date: May 11, 2012

wherein said current temperature setpoint is set based upon said input from said at least one specific occupant~~one or more users~~.

11. (Original) The system of Claim 10 wherein said wireless device is a remote controller.

12. (Original) The system of Claim 10 wherein said wireless device is a wireless phone.

13. (Original) The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. (Previously Presented) The system of Claim 10 said wireless device is a tablet computer.

15. (Original) The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

16. (Original) The system of Claim 10 wherein said wireless device communicates with a remote server.

17. (Original) The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. (Proposed Amendment) The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said at least one specific occupant~~one or more users~~.

Application No.: 13/470,074
Filing Date: May 11, 2012

SUMMARY OF INTERVIEW

Attendees, Date and Type of Interview

Two telephone interviews were conducted, the first occurred on August 25, 2015 and the second occurred on August 28, 2015. Both telephone interviews were attended by Examiner Karim and John R. King.

Exhibits and/or Demonstrations

None.

Identification of Claims Discussed

Claim 1.

Identification of Prior Art Discussed

U.S. Publication No. 2008/0281472 to Podgorny

U.S. Publication No. 2009/0065596 to Seem, et al.

Proposed Amendments

Please see the amendments to Claim 1 as set forth above.

Principal Arguments and Other Matters

Please see the Remarks as set forth below.

Results of Interview

It was Applicant's understanding that the amendments to Claim 1 further clarify Claim 1. In addition, it was Applicant's understanding that Examiner Karim would further evaluate the amendments to Claim 1 as well as amendments made to other claims upon submission of this response.

Application No.: 13/470,074
Filing Date: May 11, 2012

REMARKS

This Supplemental Amendment amends Claims 1, 5, 10, and 14. Thus, after entry of this Supplemental Amendment, Claims 1-18 are pending and presented for further consideration.

INTERVIEW

Applicant would like to thank Examiner Karim for the two telephone interviews extended to Applicant's counsel of record, John R. King, on August 25, 2015 and August 28, 2015.

Applicant has endeavored to revise the claims to further clarify the claims as proposed by Examiner Karim.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks,

Application No.: 13/470,074
Filing Date: May 11, 2012

reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 8-31-2015

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20995
(949) 760-0404

21479153
083115

Electronic Acknowledgement Receipt

EFS ID:	23359545
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/ThuyQuyen Nguyen
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	31-AUG-2015
Filing Date:	11-MAY-2012
Time Stamp:	16:39:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C1_supparamend.pdf	333204 12085e011e1ca1b27754a015f08212014c101e98906	yes	8

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Supplemental Response or Supplemental Amendment		1	1
Claims		2	5
Applicant summary of interview with examiner		6	6
Applicant Arguments/Remarks Made in an Amendment		7	8

Warnings:**Information:**

Total Files Size (in bytes):	333204
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
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 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/470,074	05/11/2012	John Douglas Steinberg	EEACT.011C1	4061

20995	7590	07/28/2015
KNOBBE MARTENS OLSON & BEAR LLP		
2040 MAIN STREET		
FOURTEENTH FLOOR		
IRVINE, CA 92614		

EXAMINER	
KARIM, ZIAUL	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
07/28/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jayna.cartee@knobbe.com
 cfiling@knobbe.com

Applicant-Initiated Interview Summary

Application No.

13479.074

Applicant(s)

STEINBERG, JOHN
DOUGLAS

Examiner

ZIAUL KARIM

Art Unit

2127

All participants (applicant, applicant's representative, PTO personnel):

(1) ZIAUL KARIM(3) Inventor John Steinberg(2) Alex John King

(4) _____

Date of interview: 22 July 2015

Type:

☒ Telephonic☐ Video Conference☐ Personal (copy given to: ☐ applicant☐ applicant's representative)Exhibit shown or demonstration conducted: ☐ Yes ☐ No

If Yes, brief description: _____

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☐ Others

(For each of the checked boxes above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1

Identification of prior art discussed: _____

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references, etc.)

Inventor explained claimed invention and differences between the claims and prior art. Applicant's representative share proposed amendment. Examiner agreed that proposed amendment overcome the art rejections. No agreements in terms of allowance was reached during the interview.**Applicant recordation instructions:** The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04.) If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.**Examiner recordation instructions:** Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.☐ Attachment/ZIAUL KARIM
Examiner, Art Unit 2127MOHAMMAD ALI
Supervisory Patent Examiner, Art Unit 2127

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)**

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

EFACT.011C1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	: John Douglas Steinberg
App. No.	: 13/470,074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Karim, Ziaul
Art Unit	: 2127
Conf. No.	: 4061

RESPONSE TO OFFICE ACTION DATED MARCH 27, 2015

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed March 27, 2015, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Summary of Interview begins on page 6 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Application No.: 13/470,074

Filing Date: May 11, 2012

AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 5, 10, and 14 as indicated below.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated with said structure deemed to be occupied;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining a probability that the specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

determining that said one or more specific occupants ~~users of said wireless device~~ has previously indicated a preference that said ~~user's~~ specific occupant's input be obtained before automatically changing said current HVAC temperature setpoint in response to said activity status;

prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

Application No.: 13/470,074

Filing Date: May 11, 2012

in response to said prompting, receiving input from said one or more users; and

keeping said current HVAC temperature setpoint based upon said input from said one or more users.

2. (Original) The method of Claim 1 wherein said wireless device is a remote control.

3. (Original) The method of Claim 1 wherein said wireless device is a wireless phone.

4. (Original) The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. (Currently Amended) The method of Claim 1 wherein said wireless device is used to determine which occupant of said structure is likely to be present, and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said wireless device a tablet computer.

6. (Original) The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server.

7. (Original) The method of Claim 1 in which said wireless device communicates with a remote server.

8. (Original) The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. (Original) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

10. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

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Filing Date: May 11, 2012

at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the presence ~~existence~~ of occupants in said structure;

at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied,

said application determining a probability that the specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by a specific occupant or occupants of said structure;

said application determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device;

said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained,

wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

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wherein said current temperature setpoint is set based upon said input from said one or more users.

11. (Original) The system of Claim 10 wherein said wireless device is a remote controller.

12. (Original) The system of Claim 10 wherein said wireless device is a wireless phone.

13. (Original) The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. (Currently Amended) The system of Claim 10 said wireless device is ~~used to determine which occupant of said structure is likely to be using at least one of said electronic devices, and said second temperature setpoint is selected based upon the preferences of the occupant determined to be using said at least one electronic device~~ a tablet computer.

15. (Original) The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

16. (Original) The system of Claim 10 wherein said wireless device communicates with a remote server.

17. (Original) The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. (Original) The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

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Filing Date: May 11, 2012

SUMMARY OF INTERVIEW

Attendees, Date and Type of Interview

The interview was conducted on June 22, 2015 and attended by Examiner Karim, John R. King and John Steinberg.

Exhibits and/or Demonstrations

None.

Identification of Claims Discussed

Claim 1.

Identification of Prior Art Discussed

U.S. Publication No. 2008/0281472 to Podgorny

U.S. Publication No. 2009/0065596 to Seem, et al.

Proposed Amendments

Please see the amendments to Claim 1 as set forth above.

Principal Arguments and Other Matters

Please see the Remarks as set forth below.

Results of Interview

It was Applicant's understanding that the amendments to Claim 1 further distinguished Claim 1 from the cited references. In addition, it was Applicant's understanding that the Examiner would further evaluate the amendments to Claim 1 as well as amendments made to other claims upon submission of this response.

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REMARKS

The March 27, 2015 Office Action was based upon pending Claims 1-18. This Amendment amends Claims 1, 5, 10, and 14. Thus, after entry of this Amendment, Claims 1-18 are pending and presented for further consideration.

INTERVIEW

Applicant would like to thank Examiner Karim for the interview extended to Applicant's counsel of record, John R. King, on June 22, 2015. The interview helped clarify the issues raised in the Office Action. Accordingly, Applicant has endeavored to revise the claims with the Examiner's comments in mind.

ISSUES RAISED IN THE OFFICE ACTION

Claims 1-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny (hereinafter "Podgorny") in view of U.S. Publication No. 2009/0065596 to Seem, et al. (hereinafter "Seem").

In this response, Podgorny and Seem are referred to both individually and collectively, as "the cited references."

Claim 1

As discussed in the interview, the cited references use self-identifying technology such as RFID tags to identify an occupant. Amended Claim 1, in contrast, attempts to determine the identity of an occupant based on the occupant's behavior.

For example, amended Claim 1 is directed to determining a user based on the audio and/or video that is being reproduced by the wireless device. More specifically, amended Claim 1 determines a probability that the specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by a specific occupant or occupants.

In light of the differences between amended Claim 1 and the cited references, Applicant respectfully asserts that amended Claim 1 is patentably distinguished over the cited references and Applicant respectfully requests allowance of amended Claim 1.

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Claims 2-9

Claims 2-9 depend from amended Claim 1 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 1, and because of the additional features recited therein.

Claim 10

Amended Claim 10 is of different scope than Claim 1, and Applicant requests the Examiner to separately evaluate the patentability of amended Claim 10 in light of the arguments set forth below.

In particular, Claim 10 is directed to a system for altering the setpoint on a thermostat for space conditioning of a structure. Like Claim 1, amended Claim 10 is directed to determining a user based on the audio and/or video that is being reproduced by the wireless device. More specifically, amended Claim 1 determines a probability that the specific audio and/or video content being reproduced by said wireless device is associated with the use of said wireless device by a specific occupant or occupants.

In light of the differences between amended Claim 10 and the cited references, Applicant respectfully asserts that amended Claim 10 is patentably distinguished over the cited references and Applicant respectfully requests allowance of amended Claim 10.

Claims 11-18

Claims 11-18 depend from amended Claim 10 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 10, and because of the additional features recited therein.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Application No.: 13/470,074

Filing Date: May 11, 2012

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/944,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg	12/502,064 Now Pat. 8,180,492	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Now Pat. 8,498,753	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Now Pat. 8,740,100	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption

Application No.: 13/470,074

Filing Date: May 11, 2012

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	12/778,052 Now Pat. 8,596,550	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Now Pat. 8,556,188	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Now Pat. 8,131,497	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Now Pat. 8,131,506	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	13/219,381 Published 2011/0307103	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Now Pat. 8,423,322	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	13/329,117 Now Pat. 8,340,826	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/409,697 Now Pat. 8,412,488	03/01/12	EFACT.004C2	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/409,729 Now Pat. 8,886,488	03/01/12	EFACT.005C2	System And Method For Calculating The Thermal Mass Of A Building
Steinberg	13/470,074 Published 2012/0221151	05/11/12	EFACT.011C1	System And Method For Using A Wireless Device As A Sensor For An Energy Management System
Hublou et al.	13/523,697 Published 2013/0338837	06/14/12	EFACT.014A	System And Method For Optimizing Use Of Individual HVAC Units In Multi-Unit Chiller-Based Systems

Application No.: 13/470,074

Filing Date: May 11, 2012

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	13/725,447 Now Pat. 8,712,590	12/21/12	EFACT.013C2	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	13/852,577 Now Pat. 8,738,327	03/28/13	EFACT.004C3	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	13/858,710 Now Pat. 8,751,186	04/08/13	EFACT.005C3	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/861,189 Now Pat. 9,057,649	04/11/13	EFACT.006C2	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg et al.	13/952,253 Published 2013/0310989	07/26/13	EFACT.009C1	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	14/048,932 Now Pat. 8,840,033	10/08/13	EFACT.012C1	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/082,675 Published 2014/0188290	11/18/13	EFACT.007C1	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	14/263,762 Published 2014/0229018	04/28/14	EFACT.013C3	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	14/285,384 Published 2015/0043615	05/22/14	EFACT.004C4	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg	14/292,377 Published 2015/0021405	05/30/14	EFACT.008C1	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg	14/491,554 Published 2015/0168001	09/19/14	EFACT.012C2	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg et al.	14/527,433 Published 2015/0120235	10/29/14	EFACT.005C4	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	14/731,221	06/04/15	EFACT.006C3	System And Method For Evaluating Changes In The Efficiency Of An HVAC System

Application No.: 13/470,074

Filing Date: May 11, 2012

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing references for consideration. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Application No.: 13/470,074

Filing Date: May 11, 2012

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 7-23-2015

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20995
(949) 760-0404

21201141
079315

Docket No.: EFACT.011C1

Customer No. 20995

INFORMATION DISCLOSURE STATEMENT

Inventor	: John Douglas Steinberg
App. No.	: 13/470,074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Karim, Ziaul
Art Unit	: 2127
Conf. No.	: 4061

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith.

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed after receipt of a First Office Action, but before the mailing date of a Final Action and before the mailing date of a Notice of Allowance. This Statement is accompanied by the fees set forth in 37 CFR 1.17(p).

Application No.: 13/470074

Filing Date: May 11, 2012

The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 7-23-2015

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20995
(949) 760-0404

21157260ad
07/17/15

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary)	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2127
SHEET 1 OF 1	Examiner	Karim, Ziaul
	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	12/805705	06/10/2010	Crabtree	
	2	13/729401	12/28/2012	Sloop	
	3	14/731,221	06/04/2015	Steinberg, et al.	
	4	5,348,078	09/20/1994	Dushane et al.	
	5	6,700,224	03/02/2004	Biskup, Sr.,	
	6	7,206,670	04/17/2007	Pimputkar, et al.	
	7	7,869,904	01/11/2011	Cannon et al.	
	8	8,850,348	09/30/2014	Fadell et al.	
	9	9,057,649 (EFACT.006C2)	06/16/2015	Steinberg, et al.	
	10	2013/0173064	07/04/2013	Fadell et al.	
	11	2013/0178985	07/11/2013	Lombard et al.	
	12	2014/0316581	10/26/2014	Fadell et al.	
	13	2015/0025691	01/22/2015	Fadell et al.	
	14	2015/0120235 (EFACT.005C4)	04/30/2015	Steinberg et al.	
	15	2015/0168001 (EFACT.012C2)	06/18/2015	Steinberg	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

21157086:ad
071715

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p> <p>0095</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	13470074			
Filing Date:	11-May-2012			
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	2251	1	100	100
Miscellaneous:				
Submission- Information Disclosure Stmt	2806	1	90	90
Total in USD (\$)				190

Electronic Acknowledgement Receipt

EFS ID:	23004474
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Kealani Aguon
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	23-JUL-2015
Filing Date:	11-MAY-2012
Time Stamp:	16:31:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$190
RAM confirmation Number	3337
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.01(b) (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C1_response.pdf	619094 d11d849e44c126e4a65914e9cd78c98c35.pdf	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant summary of interview with examiner		6	6	
	Applicant Arguments/Remarks Made in an Amendment		7	13	
Warnings:					
Information:					
2		EFACT-011C1_IDS.pdf	147749 c58b02e08721411bd4b5dc5cc07a811707a6d86	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32815 c3607c41eada9fa9ca927fbc480c89061b11e78	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			799658		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SR/05 (8-9-17)

Approved for use through 03/31/2019. OMB 0401-0002
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Claim Number 13/479,074		Filing Date 05/11/2012		<input type="checkbox"/> To be Mailed	
ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
FOR	NUMBER PAID	NUMBER EXTRA			RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.161(a), (b), or (c))	N/A	N/A			N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.162(a), (b), or (c))	N/A	N/A			N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.163(a), (b), or (c))	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.160(a))	independent = 1			x \$	=				
INDEPENDENT CLAIMS (37 CFR 1.160(a))	independent = 1			x \$	=				
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.164(a))	if the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(5) and 37 CFR 1.164(a).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM FEE (37 CFR 1.164(b))									
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL				
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
AMENDMENT	07/23/2015	CLASSES REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
Total of one class	= 18	Minor	= 20	= 0	x \$40 =		0		
Independent (37 CFR 1.160(a))	= 2	Major	= 3	= 0	x \$210 =		0		
<input type="checkbox"/> Application Size Fee (37 CFR 1.164(a))									
<input type="checkbox"/> First Presentation of Multiple Dependent Claim (37 CFR 1.164(b))									
TOTAL ADDL FEE					0				
(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)	
AMENDMENT		CLASSES REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
Total of one class	=	Minor	=	=	x \$		=		
Independent (37 CFR 1.160(a))	=	Major	=	=	x \$		=		
<input type="checkbox"/> Application Size Fee (37 CFR 1.164(a))									
<input type="checkbox"/> First Presentation of Multiple Dependent Claim (37 CFR 1.164(b))									
TOTAL ADDL FEE									
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.									
** If the "Highest Number Previously Paid For" in THIS SPACE is less than 20, enter "20"									
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3"									
The "Highest Number Previously Paid For" (Total or Independent) is the highest number filed in the appropriate box in column 1.									

LIE
/CAROL BARNES/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a patent in the nation which it is for (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete the form and/or suggestions for reducing the burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PATENT-9100 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
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 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/470,074	05/11/2012	John Douglas Steinberg	EEACT.011C1	4061

20995	7590	03/27/2015
KNOBBE MARTENS OLSON & BEAR LLP		
2040 MAIN STREET		
FOURTEENTH FLOOR		
IRVINE, CA 92614		

EXAMINER	
KARIM, ZIAUL	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
03/27/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jayna.cartee@knobbe.com
 cfiling@knobbe.com

Office Action SummaryApplication No.
13/470,974Applicant(s)
STEINBERG, JOHN DOUGLASExaminer
ZIAUL KARIMArt Unit
2127Is a first inventor to file?
Status
No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extension of time may be granted under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after six (6) months from the mailing date of this communication.
- Filing a reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 171).
- Any reply received by the Office less than three months after the mailing date of this communication, even if timely filed, may entitle any assigned patent term adjustment. See 37 CFR 1.136(c).

Status

- 1) ☒ Responsive to communication(s) filed on 05/11/2012.
☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 219.

Disposition of Claims*

- 5) ☒ Claim(s) 1-18 is/are pending in the application.
 5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) _____ is/are allowed.
- 7) ☒ Claim(s) 1-18 is/are rejected.
- 8) ☐ Claim(s) _____ is/are objected to.
- 9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the Patent Prosecution Highway program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPI-Feedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 05/11/2012 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.65(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
- 1) ☐ Certified copies of the priority documents have been received.
- 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
- 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB-08a and/or PTO/SB-08b)
 Paper No(s)/Mail Date: 06/08/2012, 03/13/2015
- 3) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date: _____
- 4) ☐ Other: _____

Application/Control Number: 13/470,074
Art Unit: 2127

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The present application is being examined under the pre-AIA first to invent provisions.

Claims 1-18 are pending.

Claims 1 and 10 are independent.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Podgorny et al. USPGPUB 2008/0281472 (hereinafter "Podgorny") in view of Seem et al. USPGPUB 2009/0065596 (hereinafter "Seem").

As to claim 1, Podgorny teaches a method for varying temperature setpoints for an HVAC system comprising: storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied (paragraph 0092 in conjunction with paragraph 0019 "user preferences stored" in occupied/non-occupied) and at least a second HVAC temperature setpoint associated with said structure deemed to be occupied (paragraph 0009 and 0019 describe occupancy and non-occupancy and paragraph 0092 describe storing temperature setpoints and table 2

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occupancy and high/low, min/max temperature setting fields); monitoring an activity status of at least one wireless device (FIG. 2 element 508 wireless device) associated with one or more occupants of said structure (paragraph 0083 " detects the presence of the user in the Environmental Zone" which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (paragraph 0027 " graphical user interface" and paragraph 0067, 0080), wherein use of said wireless device (FIG. 2 element 508 wireless device) comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (paragraph 0083 "keyboard activity monitoring"); determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint (paragraph 0021 "maintain the environmental parameters temperature" which examiner interpreted that to maintain temperature it determine HVAC temperature setpoint associated with HVAC system and paragraph 0008, 0029-0030, 0063);

determining that said one or more users of said wireless device (paragraph 0093 "identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number" and paragraph 0005) has previously indicated a preference that said user's input be obtained before automatically changing said current HVAC temperature setpoint in response to said activity status (abstract "autonomous process control" is automatic and "occupancy sensor that recognizes the presence").

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Podgorny fails to clearly specify prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system; in response to said prompting, receiving input from said one or more users; and keeping said current HVAC temperature setpoint based upon said input from said one or more users.

However, Seem teaches prompting said one or more users based on said determining that said one or more of said user's input should be obtained (paragraph 0062 "user to specify any number of personal comfort settings" which means prompting said one or more users based on said determining that said one or more of said user's input should be obtained and paragraph 0065), wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system (paragraph 0065 "prompting by the user interface" in conjunction with FIG. 8-9 which means prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system); in response to said prompting, receiving input from said one or more users (paragraph 0065 "process 800 to adjust a building automation system setting" which means in response to said prompting, receiving input from said one or more users); and keeping said current HVAC temperature setpoint based upon said input from said one or more users (FIG. 11 element 1120 "adjust HVAC for normal

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conditions" which examiner interpreted as current setting based on the input from users and paragraph 0070).

Podgorny and Seem are analogous art because they are from the same field of endeavor and contain overlapping structural and functional similarities. They both relate to home automation and HVAC control system.

Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending message, as taught by Seem.

One of ordinary skill in the art would have been motivated to do this modification in order to improve control of environmental conditions to reflecting individual preferences , as suggested by Seem (paragraph 0003).

As to claim 2, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the method of Claim 1 wherein said wireless device is a remote control (paragraph 0067 "remote control 1006 may be configured to wirelessly communicate" and FIG. 10 which means wireless device is a remote control and paragraph 0043 describe "portable wireless device 306" which is a wireless device and it is a remote control).

As to claim 3, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

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Seem further teaches the method of Claim 1 wherein said wireless device is a wireless phone (paragraph 0043 "cell phone, PDA, or any other device with transmitting capability", here "cell phone is a wireless phone", which means wireless device is a wireless phone).

As to claim 4, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Podgorny further teaches the method of Claim 3 wherein said wireless phone is connected to a cellular network (paragraph 0005 " wireless converged networks" which means wireless phone is connected to a cellular network).

As to claim 5, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches wherein said wireless device is used to determine which occupant of said structure is likely to be present (paragraph 0026 "wirelessly detect an occupant" which means wireless device is used to determine which occupant of said structure is likely to be present), and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said wireless device (paragraph 0026 " identified and settings for various environmental preferences are recalled" which means second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said wireless device).

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As to claim 6, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server (paragraph 0008 " server computer further includes a processing circuit for accessing a memory device storing the program code" and "program code for adjusting the building automation" which examiner interpreted that it a remote server and first and second HVAC temperature setpoints are stored in a database associated with the remote server and FIG. 2 element 130 is the "server").

As to claim 7, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the method of Claim 1 in which said wireless device communicates with a remote server (paragraph 0032 "140 configured to accept a signal or input from various portable wireless devices" and FIG. 2 shows that wireless devices are communicating with a server, element 130 of FIG. 2 is a "server" and elements 502, 506 and 508 of FIG. 2 are "wireless device").

As to claim 8, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

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Podgorny further teaches the method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer (abstract, the user controlling "over the internet" at a remote computer and paragraph 0008 and Seem at et. Paragraph 0026, 0029 and FIG. 2 describe same limitations).

As to claim 9, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Podgorny further teaches the method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users (abstract " autonomous process control and interaction with system users", which means first HVAC temperature setpoint is varied automatically (autonomous) based on said input from one or more users).

As to claim 10, Podgorny teaches a system for altering the setpoint on a thermostat for space conditioning of a structure comprising: at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure (paragraph 0092 in conjunction with paragraph 0019 " user preferences stored" in occupied/non-occupied), and at least a second temperature setpoint associated with the existence of occupants in said structure (paragraph 0009 and 0019 describe occupancy and non-occupancy and paragraph 0092 describe storing temperature setpoints and table 2 occupancy and high/low, min/max temperature setting fields); at least one wireless device (FIG. 2 element 508 wireless device) associated with one or more

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occupants of said structure (paragraph 0083 " detects the presence of the user in the Environmental Zone" which means monitoring an activity status of at least one wireless device associated with one or more occupants of said structure), wherein said wireless device comprises a graphic user interface (paragraph 0027 " graphical user interface" and paragraph 0067, 0080), wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device (paragraph 0083 "keyboard activity monitoring"); an application comprising one or more computer processors that receives data regarding an activity status of said wireless device (paragraph 0059 "status monitoring and data collection") and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied (paragraph 0089 "occupancy sensor shuts the system down when users are away from their workstations" which means thermostat is set to said first temperature setpoint that indicates said structure is not occupied and paragraph 0009 and 0019), said application determining that said one or more users has previously indicated (paragraph 0093 "identifying the person and transferring his/her environmental preferences to the proper cubicle, together with the person's VoIP phone number" and paragraph 0005) a preference that said user's input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device (abstract "autonomous process control" is automatic and "occupancy sensor that recognizes the presence"), wherein said application provides electronic notice to one or more of said users of said wireless device (FIG. 2 element 508 wireless device) that said thermostat is set for a non- occupied structure (paragraph 0089

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"occupancy sensor shuts the system down when users are away from their workstations" which means user of wireless device that thermostat is set for a non-occupied structure).

But Podgorny fails to clearly specify said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and wherein said application in response to said prompting, receives input from said one or more users; and wherein said current temperature setpoint is set based upon said input from said one or more users.

However, Seem teaches said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained (paragraph 0062 "user to specify any number of personal comfort settings" which means prompting said one or more users based on said determining that said one or more of said user's input should be obtained and paragraph 0065), and whether to keep said first temperature setpoint or change to said second temperature setpoint (paragraph 0065 "prompting by the user interface" in conjunction with FIG. 8-9 which means prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system); and wherein said application in response to said prompting, receives input from said one or more users (paragraph 0065 "process 800 to adjust a building automation system setting" which

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means in response to said prompting, receiving input from said one or more users); and wherein said current temperature setpoint is set based upon said input from said one or more users (FIG. 11 element 1120 "adjust HVAC for normal conditions" which examiner interpreted as current setting based on the input from users and paragraph 0070).

Podgorny and Seem are analogous art because they are from the same field of endeavor and contain overlapping structural and functional similarities. They both relate to home automation and HVAC control system.

Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above HVAC control system, as taught by Podgorny, and incorporating the sending message, as taught by Seem.

One of ordinary skill in the art would have been motivated to do this modification in order to improve control of environmental conditions to reflecting individual preferences , as suggested by Seem (paragraph 0003).

As to claim 11, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 10 wherein said wireless device is a remote controller (paragraph 0067 "remote control 1006 may be configured to wirelessly communicate" and FIG. 10 which means wireless device is a remote control and paragraph 0043 describe "portable wireless device 306" which is a wireless device and it is a remote control).

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As to claim 12, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 10 wherein said wireless device is a wireless phone ((paragraph 0043 "cell phone, PDA, or any other device with transmitting capability", here "cell phone is a wireless phone", which means wireless device is a wireless phone) and Podgorny et al. paragraph 0005 and abstract.

As to claim 13, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 12 wherein said wireless phone is connected to a cellular network (paragraph 0043 " wireless device 306 (e.g., cell phone, PDA, or any other device with transmitting capability)", since it a cell phone so examiner interpreted that it is connected to the cellular network).

As to claim 14, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 10 said wireless device is used to determine which occupant of said structure is likely to be using at least one of said electronic devices (paragraph 0026 "wirelessly detect an occupant" which means wireless device is used to determine which occupant of said structure is likely to be present), and said second temperature setpoint is selected based upon the preferences of the occupant determined to be using said at least one electronic device (paragraph

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0026 " identified and settings for various environmental preferences are recalled" which means second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said wireless device).

As to claim 15, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server (paragraph 0008 " server computer further includes a processing circuit for accessing a memory device storing the program code" and "program code for adjusting the building automation" which examiner interpreted that it a remote server and first and second HVAC temperature setpoints are stored in a database associated with the remote server and FIG. 2 element 130 is the "server").

As to claim 16, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Seem further teaches the system of Claim 10 wherein said wireless device communicates with a remote server (paragraph 0032 "140 configured to accept a signal or input from various portable wireless devices" and FIG. 2 shows that wireless devices are communicating with a server, element 130 of FIG. 2 is a "server" and elements 502, 506 and 508 of FIG. 2 are "wireless device").

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As to claim 17, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Podgorny further teaches the system of Claim 10 further comprising a remote computer that varies said first temperature setpoint (abstract, the user controlling "over the internet" at a remote computer) and Seem at et. Paragraph 0026, 0029 and FIG. 2 describe same limitations).

As to claim 18, the combination of Podgorny and Seem teaches all the limitations of the base claims as outlined above.

Podgorny further teaches The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users (abstract " autonomous process control and interaction with system users", which means first HVAC temperature setpoint is varied automatically (autonomous) based on said input from one or more users).

It is noted that any citations to specific, pages, columns, lines, or figures in the prior art references and any interpretation of the reference should not be considered to be limiting in any way. A reference is relevant for all it contains and

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may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art. See MPEP 2123.

Conclusion

The prior art made of record and listed on the attached PTO Form 892 but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZIAUL KARIM whose telephone number is (571)270-3279. The examiner can normally be reached on Monday-Thursday 8:00-4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571 272 4105. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/ZIAUL KARIM/

Examiner, Art Unit 2127

/MOHAMMAD ALI/

Supervisory Patent Examiner, Art Unit 2127

Notice of References Cited	Application/Control No. 13/470,074		Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS	
	Examiner ZIAUL KARIM		Art Unit 2127	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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BIB DATA SHEET

CONFIRMATION NO. 4061

SERIAL NUMBER 13/470,074	FILING or 371(c) DATE 05/11/2012 RULE	CLASS 780	GROUP ART UNIT 2127	ATTORNEY DOCKET NO. EFACT.011C1	
APPLICANTS INVENTORS John Douglas Steinberg, Milbrae, CA. ** CONTINUING DATA ***** This application is a CON of 12/502,064 07/13/2009 PAT 8180492 which claims benefit of 61/134,714 07/14/2008 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 05/23/2012					
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No US USC Title 35 conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verbal and Written Acknowledgment <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (2) Acknowledgment Signature		STATE OR COUNTRY CA	SHEETS DRAWINGS 8	TOTAL CLAIMS 15	INDEPENDENT CLAIMS 2
ADDRESS KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614 UNITED STATES					
TITLE SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM					
FILING FEE RECEIVED 530	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.19 Fees (issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

PTO/SB/US Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary) SHEET 1 OF 6	Application No.	13470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2127 2127
	Examiner	Ziaul Karim
Attorney Docket No.		EPACT611C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	Ziaul Karim	Date Considered	03/17/2015
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2127
	Examiner	/Ziaul Karim/
SHEET 2 OF 5	Attorney Docket No.	EFACT.011C1

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Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	/Ziaul Karim/	Date Considered	03/17/2015
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary) SHEET 3 OF 6	Application No.	13470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2127
	Examiner	/Ziaul Karim
Attorney Docket No.		EPACT911C1

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Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	/Ziaul Karim	Date Considered	03/17/2015
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 4 OF 5	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2127
	Examiner	/Zaul Kaini/
Attorney Docket No.		EPACT.011CI

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	/Zaul Kaini/	Date Considered	03/17/2015
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	9944 2127
	Examiner	/Ziaul Karim/
SHEET 5 OF 5	Attorney Docket No.	EFACT.011C1

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	102	((John) near2 (Stenberg)) INV	US-PG-PUB; USPAT	OR	OFF	2015/03/16 12:28
S2	220	"6574537" "6619555" "6622328" "6633823" "6643567" "20090125151" "20060045105" "20090052858" "20100156808" "7242988" "4136732" "5270952" "5314004" "7894843" "5572438" "5717809" "6598058" "5977964" "7800823" "5855927" "20100280643" "7586225" "7802618" "20100182285" "5462225" "20110031323" "20070045431" "20100019051" "4403644" "6400996" "8595430" "6622925" "20090099899" "20070140120" "5682949" "20090099899" "20090281667" "5261481" "7354035" "6351693" "6480803" "6628997" "20080281472" "4655279" "5818347" "20100070083" "20100070093" "20100211284" "20100235004" "20080283821" "4874027" "6145751" "6437892" "7483964" "H002178" "5544036" "7055759" "7848900" "6540190" "6554825" "6622097" "7644869" "20090240381" "20100070086" "7355384" "5781083" "6178382" "6536675" "6542076" "6671586" "6912429" "7061393" "20090125151" "4341346" "5244146" "6260765" "20100019052" "7784704") FN.	US-PG-PUB; USPAT; USCOR; FFRS; EPO; JFO; DERWENT; IBM_TDB	OR	OFF	2015/03/16 12:30
S3	4	S2 and rosen in.	US-PG-PUB; USPAT; USCOR; FFRS; EPO; JFO; DERWENT; IBM_TDB	OR	OFF	2015/03/16 12:31
S4	1	S2 and rosen in. and override	US-PG-PUB; USPAT; USCOR; FFRS; EPO; JFO; DERWENT; IBM_TDB	OR	OFF	2015/03/16 12:32
S5	0	"11335182" app.	US-PG-PUB; USPAT; USCOR;	OR	OFF	2015/03/16 12:32

			FFRS; EPO; JPO; DERWENT; IBM TDB			
S6	2	(11/335182).app.	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:32
S7	2	S6 and over\$ide	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:33
S8	0	S6 and over\$ide and occup\$4	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:35
S9	2	S6 and over\$ide and occup\$4	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:35
S10	2	S6 and over\$ide and occup\$5	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:35
S11	2	S6 and over\$ide and occup\$5 and (user or operator) same (input or prompt\$4 or ask)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:36
S12	2	S6 and over\$ide and occup\$5 and (user or operator) same (input or prompt\$4 or ask\$3)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 12:36
S13	1748664	temperature or thermostat or HVAC or heating or cooling) with (control\$4 or setting or set \$1point)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:37
S14	22903	S13 and (temperature near (set ad	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16

		point or setpoint))	USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB			12:42
S15	460	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:43
S16	413	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:44
S17	47	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:45
S18	16	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:45
S19	16	S13 and (temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 12:45
S20	16	(temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 14:31
S21	16	(temperature near (set adj point or setpoint)) and ((remote or wireless or WiFi) near user) and ((user near interface) or GUI) and (plurality near20 (set adj point or setpoint)) with temperature and server and occu\$5 and HVAC	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 14:31
S22	3	"20080281472"	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT;	OR	ON	2015/03/16 14:36

			IBM TDB			
S23	0	((Cliff) near2 (Federspiel)).inv.	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 14:39
S24	0	((Cliff) near2 (Federspiel)).inv.	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 14:40
S25	0	((Federspiel) near2 (Cliff)).inv.	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 14:40
S26	982	HVAC and (temperature near (set ad) point or setpoint))	USPAT	OR	OFF	2015/03/16 19:07
S27	2719	HVAC and (temperature near (set ad) point or setpoint))	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	OFF	2015/03/16 19:07
S28	3071	HVAC and (temperature near (set ad) point or setpoint))	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 19:07
S29	685	HVAC and (temperature near (set ad) point or setpoint)) and (occu\$5 near5 sensor\$1)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 19:08
S30	215	HVAC and (temperature near (set ad) point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WIFI) near network)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 19:09
S31	183	HVAC and (temperature near (set ad) point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WIFI) near network) and (CUI or user ad) interface)	US-PGPUB; USPAT; USOOR; FFRS; EPO; JPO; DERWENT; IBM TDB	OR	ON	2015/03/16 19:09
S32	169	HVAC and (temperature near (set ad)	US-PGPUB	OR	ON	2015/03/16

		point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat	USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB			19:09
S33	169	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:10
S34	102	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:10
S35	52	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:11
S36	4	HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 19:11
S37	9	"7863775"	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:09
S38	4671	(G05023/1902 or F24F11/0075 or F24F11/0034 or F24F2011/0075).cpc.	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:21
S39	3	S36 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near5 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:21
S40	3	S38 and HVAC and (temperature near	US-PGPUB;	OR	ON	2015/03/17


		(set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near input)	USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB			11:22
S41	11	S36 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:23
S42	18457	700/276-298.cds.	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:24
S43	28	S42 and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:24
S44	1	236/49.3.cds and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:25
S45	3	236/51.cds. and HVAC and (temperature near (set adj point or setpoint)) and (occu\$5 near10 sensor\$1) and ((wireless or WiFi) near network) and (GUI or user adj interface) and thermostat and (user near20 interface) and (remote near5 control\$4) and ((cell or wireless) near10 phone) and ((setpoint or set adj point) near10 input)	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:26
S46	3	"20110202181"	US-PGPUB; USPAT; USCOR; FFRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 11:29
S47	8	"8386052"	US-PGPUB; USPAT;	OR	ON	2015/03/17 11:30

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S48	3	"20080167756"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 13:56

EAST Search History (Interference)

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3/18/2015 3:45:17 PM**C:\Users\zkarim\Documents\EAST\Workspaces\13470074.wsp**

Search Notes 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner ZIAUL KARIM	Art Unit 2127

CPC- SEARCHED		
Symbol	Date	Examiner
G05D23/1902	3/17/2015	ZK

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
F24F11/0076	3/17/2015	ZK
F24F11/0034	3/17/2015	ZK
F24F2011/0075	3/17/2015	ZK

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
700	276-298	3/17/2015	ZK
236	49.3, 51	3/17/2015	ZK

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search, Assignee search	3/17/2015	ZK
Google search, IP.com search	3/17/2015	ZK
East search	3/17/2015	ZK

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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10/1/2014 11:11 AM

10/1/2014 11:11 AM

1. System and method for using a wireless device as a sensor for an energy management system
The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a...
ASSIGNMENT: ECHOSTAR INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
2. System and method for using a networked electronic device as an occupancy sensor for an energy management system
The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a...
ASSIGNMENT: ECHOSTAR INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
3. System and method for using a networked electronic device as an occupancy sensor for an energy management system
The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a...
ASSIGNMENT: STEERAC (WILL CORP)
US2014/0110411A1 [US APPLICATION] 10/1/2014
4. System and method for providing supervisory control of an hvac system
A sensor surrogate (120) for causing a heating, ventilating, and air conditioning (HVAC) system (110) to maintain a desired room temperature, contains a temperature sensor (122) for determining an actual room temperature and logic embodied on at least one non-transitory computer readable medium...
ASSIGNMENT: SCHNEIDER ELECTRIC INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
5. System and method for providing supervisory control of an hvac system
A sensor surrogate (120) for causing a heating, ventilating, and air conditioning (HVAC) system (110) to maintain a desired room temperature, contains a temperature sensor (122) for determining an actual room temperature and logic embodied on at least one non-transitory computer readable medium...
ASSIGNMENT: SCHNEIDER ELECTRIC INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
6. HVAC start-up control system and method
A controller controls operation of a HVAC&R device, bringing the temperature inside a structure from a first temperature to a second temperature at a predetermined time each day. Sensors sense the temperature both inside and outside the structure. A recovery time is calculated based upon a...
ASSIGNMENT: TRISA, INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
7. iComfort: Method to measure and control your micro-climate using a smart phone
Temperature, relative humidity and air quality define comfort indoors. Individuals judge comfort by how the environment feels and smells. Heating, ventilation and air conditioning (HVAC) equipments are used to control the indoor climate and thereby control comfort. Most homes and offices are...
ASSIGNMENT: TRISA, INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
8. Method for controlling an hvac system using a proximity aware mobile device
A mobile wireless device (e.g. smart phone) may be used to remotely control an HVAC system. A program code stored in the memory of the mobile wireless device may cause the mobile wireless device to store geographic information in the memory of the mobile wireless device, monitor a location of the...
ASSIGNMENT: KODENWILL INC
US2014/0110411A1 [US APPLICATION] 10/1/2014
9. Graphical user interface for setpoint creation and modification
A user-friendly programmable thermostat is described that includes a body having a control electronic display surrounded by a ring that can be rotated and pressed inwardly to provide user input in a simple and elegant fashion. The thermostat can be used to graphically display a two-dimensional...
ASSIGNMENT: TRISA, INC

24

10. HVAC remote control unit and methods of operation

A comfort control system for controlling the comfort level in a building includes a comfort control unit and a remote control unit. The remote control unit communicates with the comfort control unit from a remote location. In one illustrative embodiment, the remote control unit includes a...

ASSIGNMENT: ROBERT W. BIL, INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

11. System and method for using a mobile electronic device to optimize an energy management system

Embodiments of the invention comprise systems and methods for using the geographic location of networked consumer electronic devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is...

ASSIGNMENT: SPECTACULAR INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

12. HVAC control system and method

An HVAC control system configured to control the environment of a building zone includes a means for determining a number of people occupying the building zone and a means for determining properties of other near transferring objects located within the building zone. The HVAC control system may also...

ASSIGNMENT: SPECTACULAR INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

13. System and method for using a mobile electronic device to optimize an energy management system

Embodiments of the invention comprise systems and methods for using the geographic location of networked consumer electronic devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is...

ASSIGNMENT: SPECTACULAR INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

14. Wireless control of a heating or cooling unit

A control system includes a remote temperature sensor configured to wirelessly communicate a signal indicative of a space temperature, and a return air temperature sensor configured to output a signal indicative of a temperature of return airflow within an air conditioning/heating unit. The system...

ASSIGNMENT: GAFF, WILLIAM J.
US2009/0286131 (01 APR 2009) [09 APR 2009]

15. Building control system with remote control unit and methods of operation

A building controller for controlling the comfort level in a building is described. The building controller may include a thermostat and wireless remote controller for communicating with the thermostat from a remote location. The thermostat may have access to a first temperature sensor for sensing a...

ASSIGNMENT: ROBERT W. BIL, INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

16. Thermostat for a HVAC

A thermostat for a HVAC comprising a data communication port for connection to the HVAC, wherein the thermostat is arranged to communicate via the data communication port an operating parameter of the HVAC, and estimate an energy consumption of the HVAC from the communicated operating parameter of...

ASSIGNMENT: ROBERT W. BIL, INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

17. Generating and implementing thermodynamic models of a structure

Apparatus, systems, methods, and related computer program products for generating and implementing thermodynamic models of a structure. Thermostats disclosed herein are operable to control an HVAC system. In controlling the HVAC system, a need to determine an expected indoor temperature profile for...

ASSIGNMENT: WILLIAMS, JR.
US2009/0286131 (01 APR 2009) [09 APR 2009]

18. HVAC remote control unit and methods of operation

A comfort control system for controlling the comfort level in a building includes a comfort control unit and a remote control unit. The remote control unit communicates with the comfort control unit from a remote location. In one illustrative embodiment, the remote control unit includes a...

ASSIGNMENT: ROBERT W. BIL, INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

19. Building control system with remote control unit and methods of operation

A building controller for controlling the comfort level in a building is described. The building controller may include a thermostat and wireless remote controller for communicating with the thermostat from a remote location. The thermostat may have access to a first temperature sensor for sensing a...

ASSIGNMENT: ROBERT W. BIL, INC.
US2009/0286131 (01 APR 2009) [09 APR 2009]

20. HVAC schedule with designated off periods

an HVAC controller may provide a user interface, for example, a monitoring display or a monitoring computer interface, which displays two or more time periods. The user interface may be configured to allow a user to schedule a setpoint for a target temperature schedule placed in the memory, or even the user can.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

2) Providing a controller with the plant gain parameters

A building controller is configured to calculate one or more plant gain parameters, as discussed herein, based on the design of a building may be relatively complex, including various devices and parameters that are designed to interact with each other to the building controller. In some instances, a

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

3) Displaying a method for automatically programming a setpoint temperature with a setpoint

A temperature control system, a thermostat, or a controller, may be configured to display a temperature adjustment screen, and an input device, including the screen or the thermostat, may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

4) Displaying a method for automatically programming a setpoint temperature with a setpoint

A monitoring system may be configured to a thermostat, which may be configured to display a setpoint temperature. The thermostat may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

5) Displaying a method for automatically programming a setpoint temperature with a setpoint

The thermostat may be configured to display a setpoint temperature. The thermostat may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

6) Displaying a method for automatically programming a setpoint temperature with a setpoint

An LED-based light may be provided in a conventional light fixture. The LED-based light may provide a user interface to display a setpoint temperature. The user interface may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

7) Displaying a method for automatically programming a setpoint temperature with a setpoint

A thermostat, which includes a user interface for displaying and receiving a setpoint temperature, may be configured to display a setpoint temperature. The thermostat may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

8) Displaying a method for automatically programming a setpoint temperature with a setpoint

A thermostat, which includes a user interface for displaying and receiving a setpoint temperature, may be configured to display a setpoint temperature. The thermostat may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

9) Displaying a method for automatically programming a setpoint temperature with a setpoint

A thermostat, which includes a user interface for displaying and receiving a setpoint temperature, may be configured to display a setpoint temperature. The thermostat may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

10) Displaying a method for automatically programming a setpoint temperature with a setpoint

The present invention provides a method for automatically programming a setpoint temperature. The method may include a user interface for displaying and receiving a setpoint temperature. The user interface may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

Accordingly, according to an embodiment, a method of controlling a HVAC system may include:

11) Displaying a method for automatically programming a setpoint temperature with a setpoint

A method and system for displaying and receiving a setpoint temperature. The method may include a user interface for displaying and receiving a setpoint temperature. The user interface may be configured to receive a user input to adjust a setpoint temperature. The user input may be a touch input, a voice input, or a manual input, or a combination of two or more of these inputs.

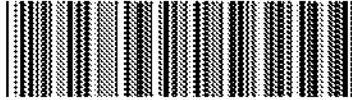
Linked Touchscreen Device

A novel small format touch screen user interface for displaying, adding and editing program setpoints is described. When editing a setpoint the user's input is constrained such that the user can only alter one parameter (either time or temperature). As soon as the user begins to drag a setpoint icon,

AS56778887, USPTO, 10/1/2015

10/1/2015 10:10:10 AM

Show next 50 Results ▾

Index of Claims 	Application/Control No. 13470074	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner DAVE ROBERTSON	Art Unit 2127

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.O.
 ☐ R.1.47

CLAIM		DATE							
Final	Original	08/01/2010							
	1	✓							
	2	✓							
	3	✓							
	4	✓							
	5	✓							
	6	✓							
	7	✓							
	8	✓							
	9	✓							
	10	✓							
	11	✓							
	12	✓							
	13	✓							
	14	✓							
	15	✓							
	16	✓							
	17	✓							
	18	✓							

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2744 2127
(Multiple sheets used when necessary)	Examiner	Ziaul Karim
SHEET 1 OF 5	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	13/523697	06/14/2012	Hublou et al.	
	2	13/725447	06/06/2013	Steinberg	
	3	13/852577	03/28/2013	Steinberg et al.	
	4	13/858710	09/05/2013	Steinberg et al.	
	5	13/861189	04/11/2013	Steinberg et al.	
	6	14/263,762	04/28/2014	Steinberg	
	7	14/285,384	05/22/2014	Steinberg, et al.	
	8	14/292,377	05/30/2014	Steinberg	
	9	14/491,554	09/19/2014	Steinberg	
	10	14/527,433	10/29/2014	Steinberg, et al.	
	11	D 646,990	10/18/2011	Rhodes	
	12	D 659,560	05/15/2012	Rhodes	
	13	D 673,467	01/01/2013	Lee et al.	
	14	D 705,095 (EFACT.015DA)	05/20/2014	EcoFactor, Inc.	
	15	5,124,502	06/23/1992	Nelson et al.	
	16	5,725,148	03/10/1998	Hartman	
	17	5,729,474	03/17/1998	Hildebrand et al.	
	18	6,079,626	06/27/2000	Hartman	
	19	6,115,713	09/05/2000	Pascucci et al.	
	20	6,241,156	06/05/2001	Kline et al.	
	21	6,400,956	06/02/2002	Richton	
	22	6,644,098	11/11/2003	Cardinale et al.	
	23	6,786,421	09/07/2004	Rosen	
	24	7,476,020	01/13/2009	Zufferey et al.	
	25	7,702,424	04/20/2010	Cannon et al.	
	26	7,758,729	07/20/2010	DeWhitt	
	27	7,894,943	02/22/2011	Sloup et al.	
	28	7,908,116 (EFACT.004A)	03/15/2011	Steinberg et al.	

Examiner Signature	/Ziaul Karim/	Date Considered	03/23/2015
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language translation is attached. ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Z.K./

Receipt date: 03/13/2015

13470074 - GAU: 2127

PTO/SB/C&E Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 2 OF 5	Application No.	13/470074	
	Filing Date	May 11, 2012	
	First Named Inventor	John Douglas Steinberg	
	Art Unit	1244 2127	
	Examiner	Ziaul Karim	
		Attorney Docket No.	EFAC7911C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29	7,908,117 (EFACT 003A)	03/15/2011	Steinberg et al.	
	30	8,010,237 (EFACT 010A)	08/30/2011	Cheung Leo et al.	
	31	8,019,567 (EFACT 006A)	09/13/2011	Steinberg et al.	
	32	8,090,477 (EFACT 013A)	01/03/2012	Steinberg	
	33	8,131,487 (EFACT 005C1)	03/06/2012	Steinberg et al.	
	34	8,131,505 (EFACT 004C1)	03/06/2012	Steinberg et al.	
	35	8,180,492 (EFACT 011A)	05/15/2012	Steinberg	
	36	8,340,826 (EFACT 013C1)	12/25/2012	Steinberg et al.	
	37	8,412,488 (EFACT 004C2)	04/02/2013	Steinberg et al.	
	38	8,423,322 (EFACT 005C1)	04/16/2013	Steinberg et al.	
	39	8,457,797	06/04/2013	Imes et al.	
	40	8,408,753 (EFACT 006A)	07/30/2013	Steinberg et al.	
	41	8,556,188 (EFACT 012A)	10/15/2013	Steinberg	
	42	8,598,550 (EFACT 007A)	12/03/2013	Steinberg et al.	
	43	8,712,590 (EFACT 013C2)	04/29/2014	Steinberg	
	44	8,738,327 (EFACT 004C3)	05/27/2014	Steinberg et al.	
	45	8,740,100 (EFACT 008A)	06/03/2014	Steinberg	
	46	8,751,186 (EFACT 005C3)	06/10/2014	Steinberg et al.	
	47	8,840,033 (EFACT 012C1)	09/23/2014	EcoFactor, Inc.	
	48	8,888,488 (EFACT 005C2)	11/11/2014	Steinberg et al.	
	49	2010/0318227	12/15/2010	Steinberg et al.	
	50	2011/0046792	02/24/2011	Imes et al.	
	51	2011/0046798	02/24/2011	Imes et al.	
	52	2011/0046799	02/24/2011	Imes et al.	
	53	2011/0046800	02/24/2011	Imes et al.	

Examiner Signature	Ziaul Karim	Date Considered	03/23/2015
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Z.K./

Receipt date: 03/13/2015

13470074 - GAU: 2127

PTO/SB/36 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 3 OF 5	Application No.	13470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	An Unit	4544 2127
	Examiner	Ziaul Karim
	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	54	2011/0048801	02/24/2011	Imes et al.	
	55	2011/0051823	03/03/2011	Imes et al.	
	56	2011/0054599	03/03/2011	Imes et al.	
	57	2011/0054710	03/03/2011	Imes et al.	
	58	2011/0173542	07/14/2011	Imes et al.	
	59	2011/0202155	08/16/2011	Imes et al.	
	60	2011/0214060	09/01/2011	Imes et al.	
	61	2011/0224838	09/15/2011	Imes et al.	
	62	2011/0246858	10/06/2011	Imes et al.	
	63	2011/0253796	10/20/2011	Posa et al.	
	64	2011/0290893	12/01/2011	Steinberg	
	65	2011/0307101	12/15/2011	Imes et al.	
	66	2011/0307189 (EFACT.010C1)	12/16/2011	Cheung et al.	
	67	2012/0023225	01/26/2012	Imes et al.	
	68	2012/0046859	02/23/2012	Imes et al.	
	69	2012/0084923	03/15/2012	Imes et al.	
	70	2012/0085935	03/15/2012	Steinberg et al.	
	71	2012/0072033	03/22/2012	Imes et al.	
	72	2012/0088562	04/12/2012	Steinberg	
	73	2012/0093141	04/16/2012	Imes et al.	
	74	2012/0101637	04/26/2012	Imes et al.	
	75	2012/0135759	05/31/2012	Imes et al.	
	76	2012/0215726	08/23/2012	Imes et al.	
	77	2012/0221718	08/06/2012	Imes et al.	
	78	2012/0252430	10/04/2012	Imes et al.	
	79	2012/0324119	12/20/2012	Imes et al.	
	80	2013/0053054	02/28/2013	Lowitt et al.	
	81	2013/0054758	02/28/2013	Imes et al.	
	82	2013/0054863	02/28/2013	Imes et al.	

Examiner Signature	(Ziaul Karim)	Date Considered	03/23/2015
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PTO/SB/36 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Multiple sheets used when necessary) SHEET 4 OF 5	Application No.	13/479074
	Filing Date	May 13, 2013
	First Named Inventor	John Douglas Steinberg
	Art Unit	2344
	Examiner	Ziaul Karim
	Attorney Docket No.	EFACF01EC1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	83	2013/0080387	03/07/2013	Imes et al.	
	84	2013/0144453	06/06/2013	Subbiso	
	85	2013/0167035	06/27/2013	Imes et al.	
	86	2013/0226502 EFACF 008C2	08/29/2013	Steinberg, et al.	
	87	2013/0310959 (EFACF 009C1)	11/21/2013	Steinberg et al.	
	88	2013/0338937 (EFACF 014A)	12/19/2013	Hublou et al.	
	89	2014/0039590 (EFACF 012C1)	02/06/2014	Steinberg	
	90	2014/0188290 (EFACF 007C1)	07/03/2014	EcoFactor, Inc.	
	91	2014/0229018 (EFACF 013C3)	08/20/2014	Steinberg	
	92	2015/0021405 (EFACF 008C1)	01/22/2015	EcoFactor, Inc.	
	93	2015/0043615 (EFACF 004C4)	02/12/2015	EcoFactor, Inc.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	94	JP 05-189659	07/30/1993	Hitachi Bill Shieetsu Eng. KK.		
	95	JP 2010-039377	02/13/2010	Mitsubishi Heavy Ind. Ltd.		
	96	JP 2010-286218	12/24/2010	Mitsubishi Heavy Ind. Ltd.		
	97	KR 10-1999-0070385	09/15/1999	Samsung Electronics Co. Ltd.		
	98	KR 10-2000-0059532	10/05/2000	Dang Hae System Co.		
	99	WO 2011/145500 (EFACF 012WO)	12/01/2011	EcoFactor, Inc.		
	100	WO 2012/024534 (EFACF 013WO)	02/23/2012	EcoFactor, Inc.		
	101	WO 2013/187995	12/19/2013	EcoFactor, Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

Examiner Signature	Ziaul Karim	Date Considered	03/23/2015
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PTO/SG/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 5 OF 5	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	2127
	Examiner	Ziaul Karim
	Attorney Docket No.	EFAC1.611C1

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ¹
	102	ARENS, et al, "How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings", 2005, research paper, Center for the Built Environment, Controls and Information Technology.	
	103	Brush, et al., Preheat - Controlling Home Heating with Occupancy Prediction, 2013.	
	104	Gupta, Adding GPS-Control to Traditional Thermostats: An Exploration of Potential Energy Savings and Design Challenges. MIT, 2009.	
	105	Gupta, et al., A Persuasive GPS-Controlled Thermostat System, MIT, 2006.	
	106	KILICOTTE, et al., "Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York", Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA, August 13-18, 2006	
	107	Krumm, et al., Learning Time-Based Presence Probabilities, June 2011.	
	108	LIN, et al., "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002.	
	109	PIER, Southern California Edison, Demand Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report, February 14, 2006.	
	110	Raji, "Smart Networks for Control", IEEE Spectrum, June 1994.	
	111	Scott, et al., Home Heating Using GPS-Based Arrival Prediction, 2010.	
	112	WANG, et al., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings," (2003), Center for Environmental Design Research.	
	113	WETTER, et al., A comparison of deterministic and probabilistic optimization algorithms for non-smooth simulation-based optimization, Building and Environment 39, 2004, Pages 989-999.	
	114	International Search Report and Written Opinion for PCT/US2013/035726 (EFACT.014WO), dated 8/6/13.	
	115	International Preliminary Report on Patentability in PCT/US2013/035726 dated 12/16/2014 (EFACT.014WO).	

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Examiner Signature /Ziaul Karim/	Date Considered 03/23/2015
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Document Description: Electronic Terminal Disclaimer - Filed

U.S. Patent and Trademark Office
Department of Commerce

Electronic Petition Request	TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT
Application Number	13470074
Filing Date	11-May-2012
First Named Inventor	John Steinberg
Attorney Docket Number	EFACT 011C1
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.311 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
EcoFactor, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s):

8:60492

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

- ☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

- ☒ Small Entity
- ☐ Micro Entity
- ☐ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

- ☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application
- Registration Number 34362
- ☐ A sole inventor
- ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application
- ☐ A joint inventor; all of whom are signing this request

Signature	/John R. King/
Name	John R. King

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
Application Number:		13470074		
Filing Date:		11-May-2012		
Title of Invention:		SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
First Named Inventor/Applicant Name:		John Douglas Steinberg		
Filer:		John R. King/Mason Leu		
Attorney Docket Number:		EFACT.011C1		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Statutory or Terminal Disclaimer	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 13470074

Filing Date: 11-May-2012

Applicant/Patent under Reexamination: Steinberg et al.

Electronic Terminal Disclaimer filed on March 13, 2015

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	21766073
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Mason Leu
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	13-MAR-2015
Filing Date:	11-MAY-2012
Time Stamp:	16:20:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$160
RAM confirmation Number	2975
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33507 f6b128c46911769121b9b00403ca72da916e c73d	no	2

Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	30500 ed145a5d9acdc628c196902bdc4762341d 6bf	no	2
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
	Examiner	Ziaul Karim
SHEET 1 OF 5	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	2	13/725447	06/06/2013	Steinberg	
	3	13/852577	03/28/2013	Steinberg et al.	
	4	13/858710	09/05/2013	Steinberg et al.	
	5	13/861189	04/11/2013	Steinberg et al.	
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	May 11, 2012
	First Named Inventor	John Douglas Steinberg
	Art Unit	3744
SHEET 2 OF 5	Examiner	Ziaul Karim
	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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PTO/SB/08 Equivalent

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	Art Unit	3744
	Examiner	Ziaul Karim
SHEET 3 OF 5	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	Art Unit	3744
SHEET 4 OF 5	Examiner	Ziaul Karim
	Attorney Docket No.	EFACT.011C1

U.S. PATENT DOCUMENTS					
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Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

Examiner Signature	Date Considered
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	Examiner	Ziaul Karim
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Espacenet

Bibliographic data: JPH05189659 (A) — 1993-07-30

**METHOD AND DEVICE FOR CALCULATING RATE OF CENTRAL AIR-
CONDITIONING DEVICE**

No documents available for this priority number

Inventor(s): SEKIGUCHI KYOICHI; KABETA AKIRA ± (SEKIGUCHI KYOICHI, ;
KABETA AKIRA)

Applicant(s): HITACHI BILL SHISETSU ENG KK ± (HITACHI BILL SHISETSU
ENG KK)

Classification: - international: **F24F5/00; G07F15/08**; (IPC1-7): F24F5/00;
G07F15/08

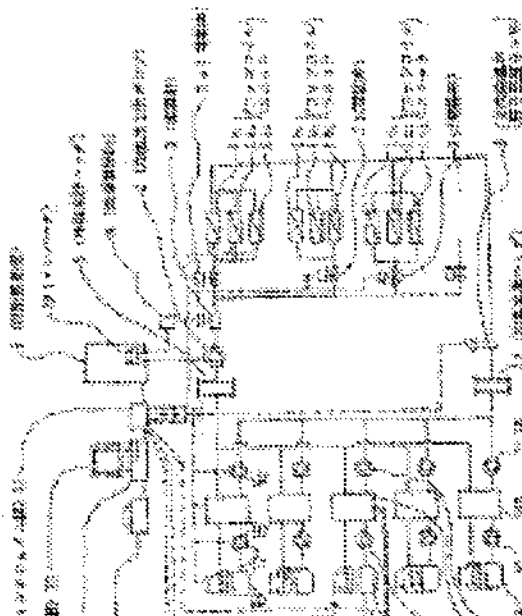
- cooperative:

Application number: JP19920003090 19920110

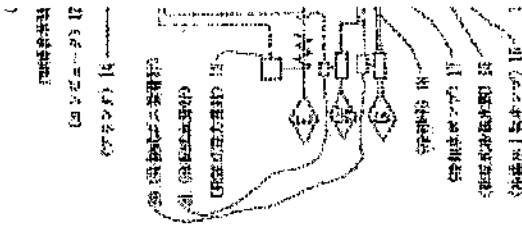
Priority number (s): JP19920003090 19920110

Also published as: JPH071611 (B2)

Abstract of JPH05189659 (A)



PURPOSE: To provide automatic rate calculating method and device capable of optionally operating individual load side apparatuses (e.g. fan coil units) by improving a central air-conditioning equipment utilizing an absorption type water



cooling/heating machine having inexpensive energy cost. **CONSTITUTION:** Plural fan coil units (1aa to 1a3) having the same or similar load pattern (a load rate and a load time band) are operated as one piping system and monitored and controlled by a computer 12 through a motor-operated valve 2a, the working electric energy, gas flow rate and consumed amount of water of respective apparatuses constituting the air-conditioning equipment are detected and inputted to the computer, running cost is calculated and the quantity of energy used by respective load side apparatuses is calculated, and the running cost is proportionally distributed in accordance with the quantity of used energy.

Last updated: 09.10.2013 Worldwide Database 5.8.11.5; 93p

(10) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

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F 2 4 F 5/00	1 0 1 Z	6803-3L		

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(71) 出願人 39104890

日立ビル建設エンジニアリング株式会社
東京都千代田区神田和泉町1番地

(72) 発明者 関口 新一

東京都足立区中川四丁目16番20号 日立ビル建設エンジニアリング株式会社日立ビルシステム研究センター内

(72) 発明者 壁田 順

東京都千代田区神田和泉町1番地 日立ビル建設エンジニアリング株式会社内

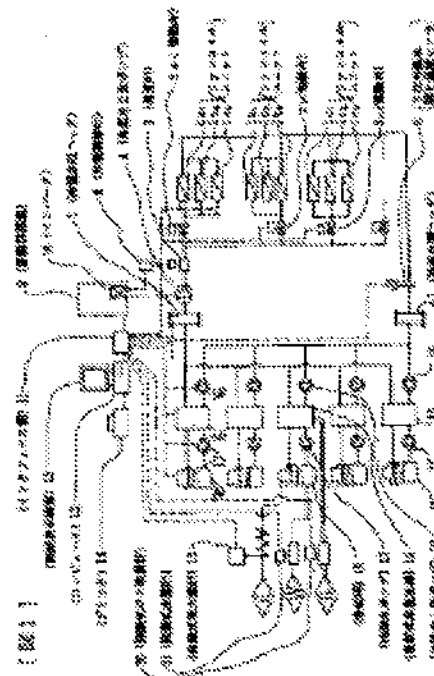
(74) 代理人 舟橋元 杉本 正実

(54) 【発明の名称】 セントラル冷暖房設備の料金算出方法および同料金算出装置

(57) 【要約】

【目的】 エネルギーコストの安い吸収式冷暖水機を用いたセントラル冷暖房設備を改良して、個々の負荷調整器(例えばファンコイルユニット)を任意に操作し得る、自動的料金計算方法、および同装置を提供する。

【構成】 負荷パターン(負荷率および負荷時間等)が同様ないし類似のファンコイルユニット(1a₁、1a₂、1a₃)を一つの配管系とし、電動弁2aを介してコンピュータ12によって監視、制御するとともに、冷暖房設備を構成している各機器の使用電力量、ガス流量、水流量を検出して上記コンピュータに入力してランニングコストを算出し、かつ、各負荷調整器が利用したエネルギー量を算出し、ランニングコストを利用エネルギー量によって比例配分する。



(2)

特開平5-189659

【特許請求の範囲】

【請求項1】 グループ毎に区分した多数の負荷側機器をグループ毎に接続した複数の配管系と、上記複数の配管系のそれぞれに設けられた電動弁と、上記多数の負荷側機器に冷温水を供給する複数の吸排式冷温水機およびその補機よりなる機器と、以上に述べた各機器の運転戻り信号を入力されるとともに、該各機器に対して運転指令信号を出力するセントラル冷暖房装置の料金を算定する方法であって、前記の各機器が消費した電力をコンピュータに入力して金額に換算し、同じく、消費した水道水量を前記のコンピュータに入力して金額に換算し、同じく、消費した燃料ガス量を前記のコンピュータに入力して金額に換算し、前記各機器に属した付帯経費を前記のコンピュータに入力し、上記の入力値に基づいて、前記のコンピュータにより当該冷暖房装置のランニングコストを算出し、一方、前記負荷側機器の戻り信号に基づいて、多数の負荷側機器のそれぞれについて利用したエネルギー量を算出し、前記のランニングコストに、換すれば係数を乗じて、多数の負荷側機器それぞれの利用エネルギー量に比例配分することを特徴とする、セントラル冷暖房装置の料金算出方法。

【請求項2】 グループ毎に区分した多数の負荷側機器をグループ毎に接続した複数の配管系と、上記複数の配管系のそれぞれに設けられた電動弁と、上記多数の負荷側機器に冷温水を供給する複数の吸排式冷温水機およびその補機よりなる機器と、以上に述べた各機器の運転戻り信号を入力されるとともに、該各機器に対して運転指令信号を出力するセントラル冷暖房装置の料金を算出する装置であって、上記の各機器が消費する電力を検出する電力計と、水道水量を検出する水量計と、燃料ガス量を検出するガス流量計とを具備しており、上記電力計の出力信号と、水量計の出力信号と、ガス流量計の出力信号とを入力されて、電気料金、水道料金およびガス料金を算出する演算機能を有するとともに、多数の負荷側機器のそれぞれについて、利用エネルギー量を算出する演算機能を有し、かつ、料金合計を各負荷側機器の利用エネルギーについて比例配分する演算機能を有するコンピュータを具備していることを特徴とする、セントラル冷暖房装置の料金算出装置。

【請求項3】 前記のコンピュータは、前記多数の負荷側機器のそれぞれについて、その能力を記憶する記憶回路と、その運転時間を算定するタイマ回路とを有しており、上記の能力は運転時間を乗じて負荷側機器ごとに利用エネルギー量を算出するものであることを特徴とする、

請求項2に記載したセントラル冷暖房装置の料金算出装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、細分化された負荷側機器を算えたセントラル冷暖房装置において、多数の負荷側機器ごとに適正な料金を自動的に算出する方法、および自動的に算出する装置に関するものである。

【0002】

【従来の技術】集合住宅やテナントビルなどの空調を行う場合、空調負荷が細分化され、かつそれらの空調負荷の時間帯が複雑であって、監視、制御が困難である。集合住宅においては、居住している多数の家族のそれぞれが独自の生活様式を有しているため空調負荷のパターンが多様であることは周知通り。テナントビルにおいては集合住宅に比してこうした問題が少なくとされてきたが、最近ではテナントビルにおいても空調負荷のパターンが多様化する傾向にある。このように、細分化された空調負荷のそれぞれが多様なパターンを有しているという条件下においては、従来一般に電熱式パッケージエアコンを用いた個別空調方式が用いられていて、セントラル冷暖房は運用できないとされていた。その理由は、多様化した空調時間帯や負荷変動に対応して緻密な監視、制御が困難なこと、および、多数の空調負荷のそれぞれについて個別に、適正な料金を算出できないことであった。

【0003】

【発明が解決しようとする課題】集合住宅やテナントビルにおける個別空調方式とセントラル冷暖房方式とを比較すると、個別空調方式は一般に設備コストもランニングコストも顕著である。また、ビル全体としての受電容量も大きく設定しなければならない。また、個別空調方式ではビルの外壁に多数の屋外機が設置されてビルの美観を損ねるという問題もある。セントラル冷暖房方式は経済的に有利であるにも拘らず、使い勝手の面から昨今のビル空調にマッチしないとして敬遠されている。このように、集合住宅の各家庭やテナントビルの各入居者が、多少のコスト高を承知で使い勝手の良いことを求めるのは、機式ではやむを得ないことではあるが、エネルギー資源の節約という社会的な要請に背くものである。特に、エネルギー資源に乏しい我國の産業を考え合わせると、国家的表成に背くものと言っても過言ではない。本発明は上述の事情に鑑みて為されたものであって、集合住宅やテナントビルなどのように負荷が細分化されている冷暖房設備において、集中熱源機として、ランニングコストが安く、ビル全体の受電容量を抑制し得る吸排式冷温水機を用い、かつ、各居住者のそれぞれが負荷側機器を自由に操作することができ、しかも各負荷側機器ごとに適正な料金を自動的に算出し得る方法、および、上記の方法を実施するに好適な算出装置を提供すること

(3)

発明者 5-189659

を目的とする。

【0004】

【課題を解決するための手段】上記の目的を達成するために提供した本発明の基本的原理は、多数の空調負荷（例えばファンコイルユニット）を、空調時間帯が懸念しているものの毎のグループに区分して配管系を構成し、グループ単位の監視、制御を行うとともに、消費電力料金、ガス料金、水道料金を合計したランニングコストを、上記多数の空調負荷（例えばファンコイルユニット）毎の利用エネルギー量に比例配分するものである。上述の原理に基づく具体的な手法として本発明に係る方法は、グループ毎に区分した多数の負荷側機器をグループ毎に接続した複数の配管系と、上記複数の配管系のそれぞれに設けられた電動弁と、上記多数の負荷側機器に冷温水を供給する複数の吸気式冷温水機およびその補機よりなる機器と、以上に述べた各機器の運転制御信号を入力されるとともに、該各機器に対して運転指令信号を出力するセントラル冷暖房装置の料金を算定する方法であって、前記の各機器が消費した電力をコンピュータに入力して金額に換算し、同じく、消費した水道水量を前記のコンピュータに入力して金額に換算し、同じく、消費した燃料ガス量を前記のコンピュータに入力して金額に換算し、前記各機器に費した付帯経費を前記のコンピュータに入力し、上記の入力値に基づいて、前記のコンピュータにより当該冷暖房装置のランニングコストを算出し、一方、前記負荷側機器の戻り信号に基づいて、多数の負荷側機器のそれぞれについて利用したエネルギー量を算出し、前記のランニングコストに、費すれば係数を乗じて、多数の負荷側機器それぞれの利用エネルギー量に比例配分することを特徴とする。

【0005】また、上記の発明方法を実施するために構成した本発明に係る料金の算定装置は、グループ毎に区分した多数の負荷側機器をグループ毎に接続した複数の配管系と、上記複数の配管系のそれぞれに設けられた電動弁と、上記多数の負荷側機器に冷温水を供給する複数の吸気式冷温水機およびその補機よりなる機器と、以上に述べた各機器の運転制御信号を入力されるとともに、該各機器に対して運転指令信号を出力するセントラル冷暖房装置の料金を算定する装置であって、上記の各機器が消費する電力を検出する電力計と、水道水量を検出する水量計と、燃料ガス量を検出するガス流量計とを具備しており、上記電力計の出力信号と、水量計の出力信号と、ガス流量計の出力信号とを入力されて、電気料金、水道料金およびガス料金を算出する演算機能を有するとともに、多数の負荷側機器のそれぞれについて、利用エネルギー量を算出する演算機能を有し、かつ、料金合計を各負荷側機器の利用エネルギーについて比例配分する演算機能を有するコンピュータを具備していることを特徴とする。

【0006】

【作用】上記の算出装置を用いて前記の算出方法を実施すると、電気料金、ガス料金、水道料金などのランニングコストが自動的に集計されるとともに、多数の負荷側機器（例えばファンコイルユニット）毎に利用したエネルギー量が算出され、かつ、前記のランニングコストが上記の利用エネルギー量について比例配分されて、適正な料金が自動的に算出される。










【0007】

【実施例】図1は本発明に係る料金算出装置を備えたセントラル冷暖房装置の1実施例を示す系統図である。吸気式冷温水機の負荷側機器としてのファンコイルユニットは多数設置されている。本発明において多数とは10以上の整数を言うものとする。これら多数のファンコイルユニットを、その使用条件に基づいて同一ないし類似の負荷パターン（すなわち負荷率と負荷時間帯との関係状態）に区分し、同一ないし類似の負荷パターンを有するファンコイルユニット1a₁、同1a₂、同1a₃をグループaとして一つの配管系を形成し、電動弁2aおよび流量計3を介して可変流量型の冷温水2次ポンプ4の吐出口に接続する。この冷温水2次ポンプ4は冷温水往ヘッダ5から冷温水を供給され、後述のごとく前記流量計3を介して多数の負荷側機器（ファンコイルユニット）に冷温水を配送して循環させる。負荷側機器を流通した冷温水は2次冷温水戻り温度センサ6を経て冷温水還ヘッダ7に流入する。図示の1b₁、1b₂、1b₃は、相互に負荷パターンの類似するファンコイルユニットであって一つの配管系として接続され、電動弁2bを介してbグループとして前記流量計3の下流側に分岐接続されている。同様に、負荷パターンの類似するファンコイルユニット1c₁、1c₂、1c₃は、cグループとして電動弁2cを介して前記流量計3の下流側に分岐接続されている。前記流量計3の出力信号は流量調整弁8を介して動力回路制御9のインバータ10に接続され、インタフェイス盤11を介してコンピュータ12に入力される。同様に、前記の電動弁2a、同2b、同2cの開閉指令信号および開閉戻り信号もインタフェイス盤11を介してコンピュータ12に接続されている。上記のコンピュータ12には、前記ファンコイルユニットの電力および冷温水流量、並びに、次に詳述する吸気式冷温水機15の電力を予め入力しておく。本実施例（図1）においては、前記冷温水還ヘッダ7と冷温水往ヘッダ5との間に5基の吸気式冷温水機15が並列に接続されている。これら5基の吸気式冷温水機15のそれぞれは、冷温水1次ポンプ16を備えており、かつ、冷却水ポンプ17を介して冷却塔18に接続されている。そして、これらの機器で消費される電力は発電式電力計19によりインターフェイス盤11を介してコンピュータ12に入力される。また消費されるガス量は発電式ガス流量計20で、消費される水圧は発電式水量計21で、それぞれインタフェイス盤11を介してコンピュータ12

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~~SECRET~~ - 182699

に入力される。これらのデータは、設備の空調エネルギー損失計算、冷温水可変流量制御、および冷温水発生機の運転台数制御に用いられる。縦記のコンピュータ12には居住者リスト、各居住者のファンコイルユニットの配分、電気、ガス、水源のエネルギー単価、および料金計算式を入力し、記憶させておく。図1のように構成された装置(図1)において、各居住者が各居住区内に設けられているファンコイルユニットのスイッチ(図示せず)を任意に操作すると、その運転戻り信号をコンピュータ12が検知し、順次冷温水機1らとその制御に対して運転指令を出力し、電動弁に対しては開閉指令を出力する。複数基(本例において5機)の凝取式冷温水機1らは、負荷総量の大小に応じて必要台数だけ運転する。すなわち、戻り信号を入力されたファンコイルユニットの能力の合計量をその時点における総負荷量とし、この総負荷量に対して必要かつ充分な台数(端数は切り上げて計算して算出する)の凝取式冷温水機1らを運転する。その算定方法の1例を次に示す。ファンコイルユニットの総数を200台とし、それぞれのファンコイルユニットの能力を、RCU-1、RCU-2、RCU-3、……RCU=200と表わすことにする。そして、各ファンコイルユニットの能力が

FCU-1		Q ₁		
FCU-2		Q ₂		
FCU-3		Q ₃		

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Q. Now, you're going to ask me to look at the same thing again, right?

とする。一方、縦型式冷凍水機15の1基の能力を Q_{15} とすると、その数は5基であるから、

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$$E = Q \dot{\theta} / \dot{\theta} t \dots \dots \dots (2)$$
[illegible]

FOUO/SECRET, FOU-1, FOU-3, FOU
-12500000000000000000

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従って、鎖状式冷凍機構の必要運転台数は、 $\{(\alpha 1 + \alpha 5 + \alpha 12) / Q\}$ となり、この値を切り上げた整数を要求運転台数とする。

【0009】上記の選挙運動活動の経緯は、各選挙区で選挙案件で定格の能力を発揮するものと想定して、政治運動指導会員とするカテゴリーを候補者選定に基き能力で新設したものである。しかし、実際の選挙状況においては各選挙区で定格候補で行動するとは限らず、若干の劣格を以て行動している場合が多い。従って、必ずしも上記の選挙活動とこの能力が対応を要しない選挙区に多くてもない。

場合がある。例えば外気温があまり高くないと急に冷房運転を行ったり、外気温があまり低くない時に暖房運転を行う場合は、前述のようにして算出した台数片を運転しなくても足りる。このような、運転状態における余裕の程度の状態（余裕率）は、2次冷温水入り温度センサらによって検出される2次冷温水の入り温度によって判断し得る。すなわち、定格状態における2次冷温水は冷温水往ヘッドラから7で排出し、冷温水還ヘッドラに12で吸入する。この冷温水ヘッドラに吸入する2次冷温水の入り温度が12よりも低ければ運転状態に余裕があり、12よりも高ければ余裕が無いことになる。そこで、2次冷温水入り温度に基づいて算出する必要運転台数片を、次のように調整する。冷房運転の場合、

2次冷温水塔の温度	温度による
センサ6の吐出値	必要運転時間
9. 5℃以下	24. 0 = 1
11. 0℃以下	24. 0 = 2
12. 5℃以下	24. 0 = 3
14. 0℃以下	24. 0 = 4
14. 0℃以下	24. 0 = 5

凍結の過程においては、前述した凍結潜熱を数値化し、上記の温度による蒸発潜熱を数値化しをコンピュータ内で比較演算し、いずれか低い方の値をとって蒸発或凝水係 β の凍結指数を決定し、凍結指令信号を出力して凍結・解凍・制御を行う。また、前記と同様にして融解過程の場合には、

3次方程式の解の個数	根数による区別
3つの異なる実根	3根
2つの異なる実根と1つの虚根	2根
1つの異なる実根と2つの虚根	1根
3つの異なる虚根	0根

なお、定格運転状態における取替時の2次冷温水は60℃で凍出し、55、5℃で流入する。乾房運転の場合も、前述した冷房運転の場合と同様にNとN'との内でいずれか小さい方の値をとる。なお、冷、暖両方いずれの場合においても、条件の境界付近での頻繁な運転台数の変化を避ける（N台目またはN'台目の吸気式冷温水機15の頻繁な発停動作を防止する）ため、不逆時間を設けることが望ましい。また、吸気式冷温水機の運転台数制御については、5基の吸気式冷温水機15およびその付属機器の運転時間累計が平均化するよう、運転の優先順位を変更するローテーション機能と設けることも、公開技術を活用して行い得る。さらに、いずれかの吸気式冷温水機15およびその付属機器が故障した場合は、組立降機をスキップして次の吸気式冷温水機を運転するステップ動作機能を加しておくことが望ましい。

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【0010】次に、電動弁2a, 2bへの開閉制御、および同弁の開閉制御による冷温水の流量制御について説明する。多数(本例において200個)のファンコイルユニット1a₁, 1a₂, 1a₃, 1b₁, 1b₂, 1b₃への内の何れかが運転されると、この運転を開始したファンコイルユニットの運転戻り信号がコンピュータ12に入力される。該コンピュータ12には、前述のごとく総べてのファンコイルユニットに関する各種の情報が入力されていて、運転戻り信号を受けたファンコイルユニットが属している配管系グループに接続されている電動弁(2a, もしくは2b, 又は2cへの内の、いずれか1個以上)のみを開弁させ、他の電動弁は閉じておく、各電動弁の開閉状態が決定されると、冷温水の流量は開弁状態にある電動弁の必要流量の合計となり、可変流量形の冷温水2次ポンプ4はインバータ10により次に述べるようにして可変流量制御される。すなわち、コンピュータ12は流量調節計8に対して、必要流量に相当する制御用アナログ信号を出力し、又は、ポンプの回転速度-流量特性に基づいてインバータ10に対して必要回転速度に相当する制御用アナログ信号を出力する。また、ファンコイルユニットの運転戻り信号、電動弁の開閉戻り信号、吸収式冷温水機とその補機群の運転状態(運転・停止・故障など)戻り信号はインタフェース盤11を介して瞬時にコンピュータ12が入力候補できるようになっているので、前面表示装置13によって運転状態を表示することができる。上記の表示は図でなくても表であっても良い。図2は監視画面の1例である。どのような形で運転状態を表示させるかは任意に設定することができる。また、プリンタ14によってプリントアウトしても良い。このようにして冷暖房設備を構成している各種機器の一括監視が可能である。

【0011】上述のようにして運転状態を監視し制御すると同時に、次に述べるようにして冷暖房料金に関する料金算定を自動的に行わせる。各居住者がファンコイルユニットを操作して運転状態にすると、コンピュータ12はその運転戻り信号によってこれを検知し、当該ファンコイルユニットの運転時間タイマをカウントし始める。このタイマは、当該ファンコイルユニットが停止状態になるとカウントを停止する。上記のタイマは、料金決算の決算日に至るまで積算を続け、料金決算日に運転時間にファンコイルユニットの能力を乗じ、当該ファンコイルユニットの利用熱量を算出する。その具体的な方法は次のごとくである。ファンコイルユニットFCU-1の時間当たり熱量を $\alpha_1 \text{ kcal/h}$ とし、その使用時間をも $t_1 \text{ h}$ とする。ファンコイルユニットFCU-2の時間当たり熱量を $\alpha_2 \text{ kcal/h}$ とし、その使用時

間をも $t_2 \text{ h}$ とする。ファンコイルユニットFCU-3の時間当たり熱量を $\alpha_3 \text{ kcal/h}$ とし、以下同様にしてFCU-4からFCU-199までについて時間当たり熱量と使用時間とを定めて、ファンコイルユニットFCU-200の時間当たり熱量を $\alpha_{200} \text{ kcal/h}$ とし、その使用時間をも $t_{200} \text{ h}$ とする。これにより、各ファンコイルユニットの冷暖房利用料金(ランニングコスト原価)は、電気料金+ガス料金+水道料金+付帯経費を、当該ファンコイルユニットの時間当たり熱量×使用時間について比例配分して求められる。すなわち、

(電気料金+ガス料金+水道料金+付帯経費)×(当該ファンコイルユニットの時間当たり熱量×当該ファンコイルユニットの使用時間)÷($\alpha_1 t_1 + \alpha_2 t_2 + \alpha_3 t_3 + \dots + \alpha_{200} t_{200}$)となる。

居住者が複数のファンコイルユニットを利用している場合は、予めコンピュータ12に入力しておけば、居住者ごとの冷暖房利用料金を自動的に算出してプリンタ14で打ち出すことができる。

【0012】

【発明の効果】以上説明したように、本発明の料金算出装置を用いて本発明の料金算出方法を表裏すると、集合住宅やテナントビルなどのように負荷が細分化されているセントラル冷暖房設備において、集中熱源機として、ランニングコストの安い吸収式冷温水機を用い、かつ、居住者のそれぞれが負荷機器を自由に操作することができる。しかも、自由に操作して運転された多数の負荷機器のそれぞれが利用したエネルギー量に基づく公正な料金を自動的に算出することができる。

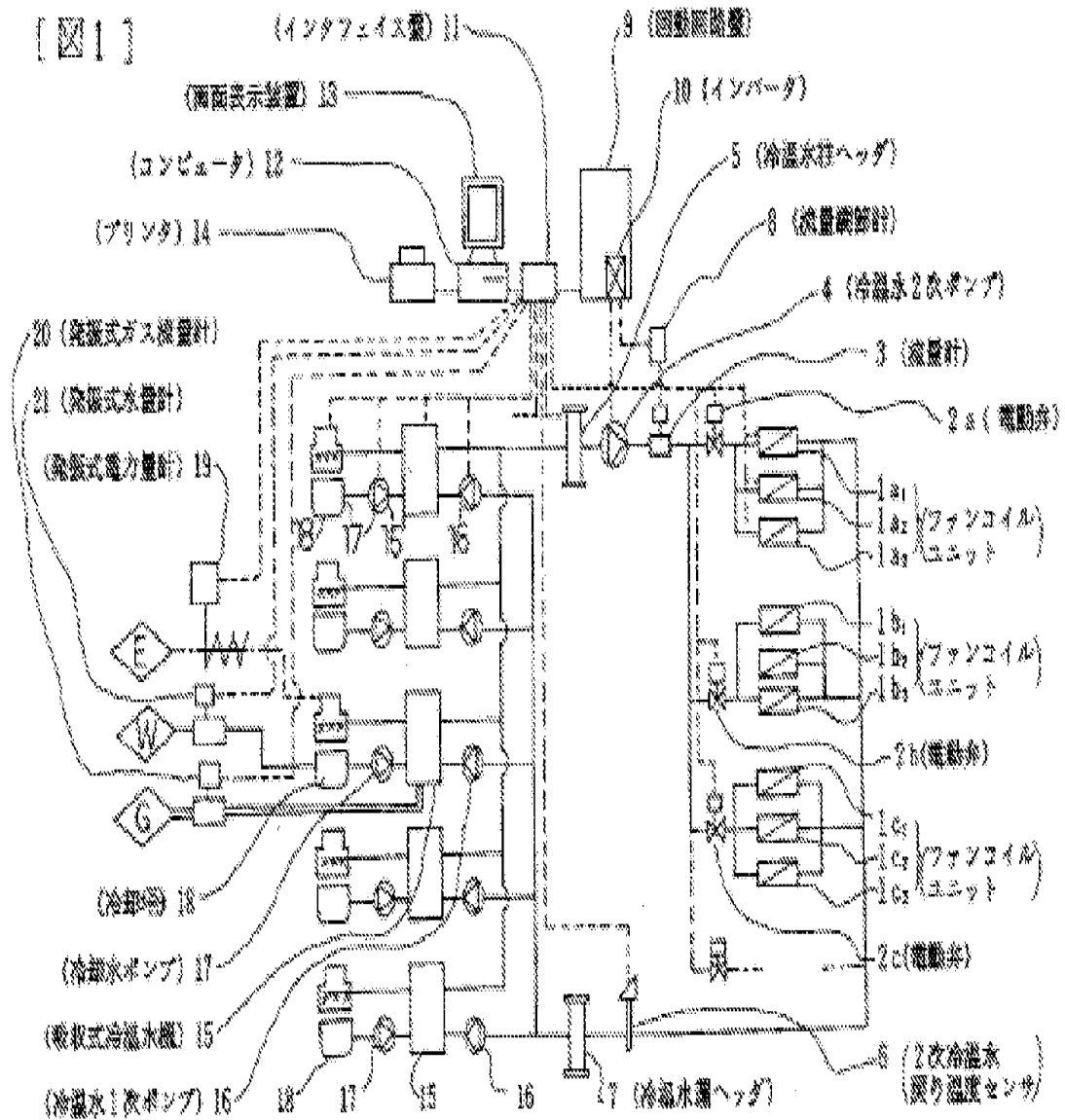
【図面の簡単な説明】

【図1】本発明の1実施例における吸収式冷温水機を用いた冷暖房設備の配管および制御系統図である。

【図2】上記実施例に係る吸収式冷温水機を用いた冷暖房設備における監視画面の平面図である。

【符号の説明】

1a₁, 1a₂, 1a₃, 1b₁, 1b₂, 1b₃, 1c₁, 1c₂, 1c₃…負荷機器としてのファンコイルユニット。2a, 2b, 2c…電動弁。3…流量計。4…冷温水2次ポンプ。5…冷温水送ヘッダ。6…2次冷温水戻り温度センサ。7…冷温水還ヘッダ。8…流量調節計。9…動力回路器。10…インバータ。11…インタフェース盤。12…コンピュータ。13…前面表示装置。14…プリンタ。15…吸収式冷温水機。16…冷温水1次ポンプ。17…冷却水ポンプ。18…冷却塔。19…発電式電力算計。20…発電式水量計。21…発電式ガス流量計。

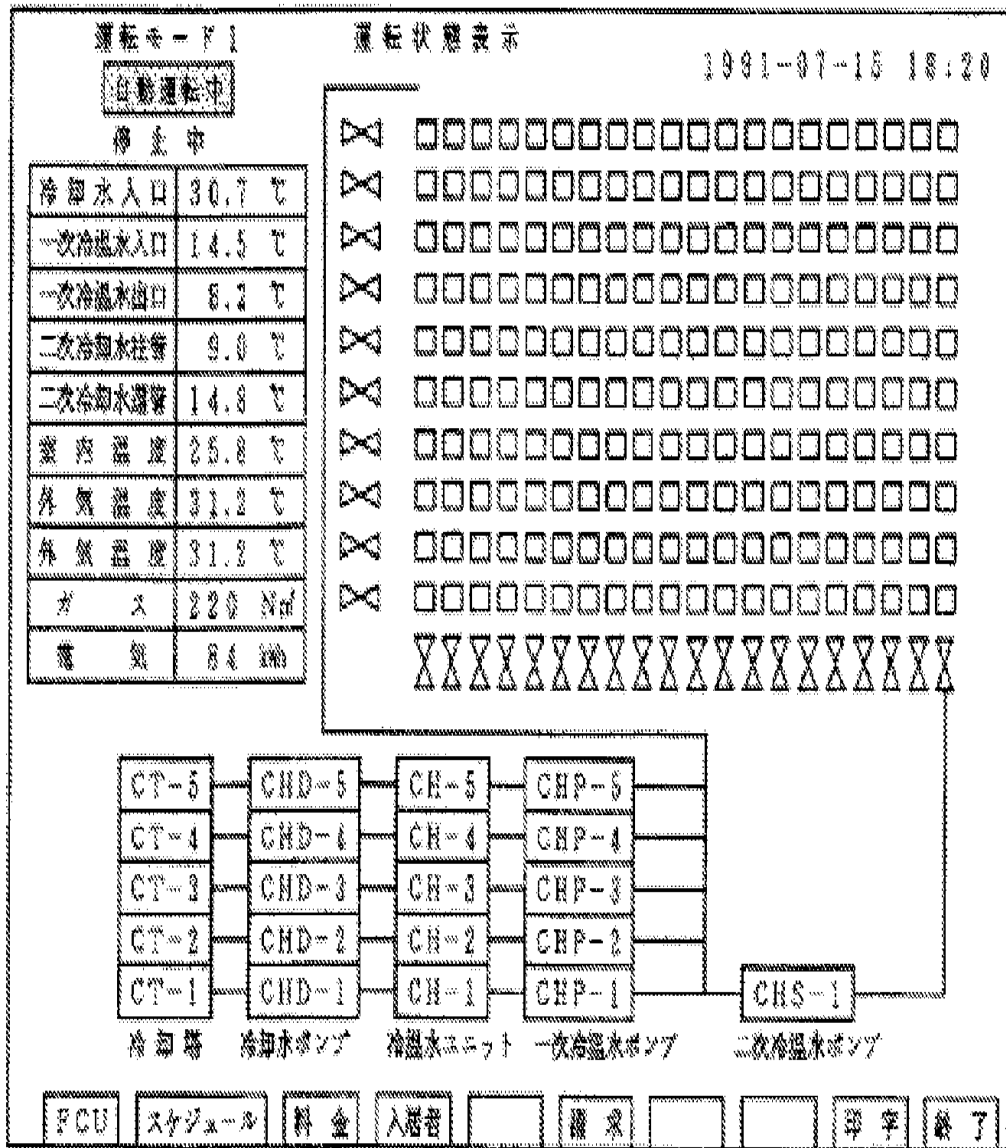


【図1】

（中）

特開2019-100000号

0167



【図2】

(7)

冷却水システム

<http://worldwide.espacenet.com/publicationDetails/biblio?DB=EPODOC&II=0&ND=3&...> 10/30/2013

(2)

特開2010-38377(P2010-38377A)

【特許請求の範囲】

【請求項1】

空調制御システムの空調料金を計算する空調料金計算装置であって、

時間帯と出力する信号とが関連付けられたスケジュール情報を有し、該スケジュール情報に基づいて出力信号を切り替えるタイマ手段と、

該タイマ手段から出力される信号と課金係数とが関連付けられている課金テーブルを有し、該タイマ手段から入力された信号に関連付けられている課金係数を該課金テーブルから取得し、取得した課金係数と電力消費情報とを用いて空調使用料金を計算する料金計算手段と

を具備する空調料金計算装置、

【請求項2】

前記タイマ手段から入力される信号はデジタル信号であり、時間帯に応じてオンオフが切り替えられる請求項1に記載の空調料金計算装置、

【請求項3】

前記料金計算手段は、前記室外機及び複数の前記室内機にネットワークを介して接続されるとともに、前記マルチ型空調装置の運転スケジュールの管理機能を有する中央制御装置に備えられている請求項1または請求項2に記載の空調料金計算装置、

【請求項4】

1台の室外機と複数の室内機とが接続されるマルチ型空調装置にネットワークを介して接続されるとともに、該マルチ型空調装置の運転スケジュールの管理機能を有する中央制御装置であって、

時間帯に応じて出力する信号を切り替えるタイマ手段と接続され、該タイマ手段から受信した信号に応じた課金情報と電力消費情報とを用いて空調使用料金を計算する中央制御装置、

【発明の詳細な説明】

【技術分野】

【0001】

本発明は、1台の室外機に対して、複数の室内機が接続されるマルチ型空調装置に関するものである。

【背景技術】

【0002】

1台の室外機に対して複数の室内機が接続されるマルチ型空調装置が知られている。例えば、1台の室外機に対して20台以上の室内機を接続することのできる大型のマルチ型空調装置では、複数のテナントにより室内機が使用される場合も少なくない。このような場合、室外機で使用された電気料金については、各室内機の運転時間等で室外機の電気料金を按分し、これに基づいて各テナントの電気料金を決定することが提案されている。

また、特許文献1には、複数の動力を用いて駆動される空調機の料金を計算する方法が開示されている。

【特許文献1】特開2006-125734号公報

【発明の開示】

【発明が解決しようとする課題】

【0003】

ところで、近年では、定時と定時外とで電気料金の単価を変えたい、定時の時間帯を毎日毎に変更したい等の様々な要望があり、この要望に応じるために、空調の制御を行う集中制御装置において予め定時と定時外の時間帯を設定し、時間帯に応じて電気料金の単価を変更することが提案されている。

しかしながら、集中コントローラにおいて電気料金の単価の管理及び計算を行おうとすると、ソフトウェアが煩雑になる、処理が煩雑になる、多くのメモリ容量を必要とする等の種々の問題があり結果的に非常にハイレードで高価な製品でしか実現できなかった。

(3)

特許2010-38377(2016-3837A)

【0004】

本発明は、上記問題を解決するためになされたもので、ソフトウェアの煩雑さを解消でき、簡便な処理で空調使用料金を計算することのできる空調料金計算装置を提供することを目的とする。

【課題を解決するための手段】

【0005】

上記課題を解決するために、本発明は以下の手段を採用する。

本発明は、空気調和システムの空調料金を計算する空調料金計算装置であって、空気調和装置の空調料金を計算する空調料金計算装置であって、時間帯と出力する信号とが関連付けられたスケジュール情報とを有し、該スケジュール情報に基づいて出力信号を切り替えるタイマ手段と、該タイマ手段から出力される信号と課金係数とが関連付けられている課金テーブルを有し、該タイマ手段から入力された信号に関連付けられている課金係数を該課金テーブルから取得し、取得した課金係数と電力消費情報とを用いて空調使用料金を計算する料金計算手段とを具備する空調料金計算装置を提供する。

【0006】

上記構成によれば、タイマ手段と料金計算手段とを接続し、タイマ手段から入力される信号に基づいて課金係数を変更することとしたので、料金計算手段においては、煩雑な処理を行うことなく、簡便な処理及び比較的少ないメモリ容量で空調使用料金の計算を行うことが可能となる。

上記空気調和システムとは、少なくとも1台の室外機と少なくとも1台の室内機を有していればよい。

【0007】

上記空調料金計算装置において、前記タイマ手段から入力される信号はデジタル信号であり、時間帯に応じてオンオフが切り替えられることとしてもよい。

【0008】

このように、デジタル信号によって時間帯の切り替えを通知するので、時間帯を容易に判定することができる。

【0009】

上記空調料金計算装置において、前記料金計算手段は、前記室外機及び複数の前記室内機にネットワークを介して接続されるとともに、前記マルチ型空気調和装置の運転スケジュールの管理機能を有する中央制御装置に接続されていることとしてもよい。

【0010】

このように、中央制御装置が料金計算手段を兼ねるので、追加装置を必要とせず、既存の装置を用いて空調使用料金の計算を行うことができる。

【0011】

本発明は、1台の室外機と複数の室内機とが接続されるマルチ型空気調和装置にネットワークを介して接続されるとともに、該マルチ型空気調和装置の運転スケジュールの管理機能を有する中央制御装置であって、時間帯に応じて出力する信号を切り替えるタイマ手段と接続され、該タイマ手段から受信した信号に基づいた課金係数と電力消費情報とを用いて空調使用料金を計算する中央制御装置を提供する。

【発明の効果】

【0012】

本発明によれば、ソフトウェアの煩雑さを解消でき、簡便な処理により空調使用料金を計算することができるという効果を奏する。

【発明を実施するための最良の形態】

【0013】

以下に、本発明に係る空調料金計算装置の一実施形態について、図面を参照して説明する。

図1は、本実施形態に係る空調料金計算装置及び該空調料金計算装置が適用されるマルチ型空気調和装置の概略構成を示したブロック図である。

(4)

特許12010-38371 (P2010-38371A)

図1に示されるように、一台の室外機1と、複数の室内機2とを備えるマルチ型空調装置を複数組備える空調システムに、中央制御装置（センターコンソール）3が接続されている。各室外機1、各室内機2、及び中央制御装置3とは、共通のネットワークを介して接続されている。

図1では、8台の室内機2が接続されている場合を示しているが、室内機2の接続台数については、最大接続台数（例えば、128台）の範囲内で任意に決定することが可能である。

【0014】

中央制御装置3は、図2に示されるように、表示部3-1及びタッチパネル式の入力部3-2を備えている。例えば、マルチ型空調装置が設置されたビルの管理者は、この中央制御装置3の表示部3-1に表示される情報を確認しながら、タッチパネル式の入力部3-2を操作することにより、室内機2の運転・運転停止、運転モード、風量、風向等を設定することができるようになっている。また、ビルの管理人は、運転スケジュール、室内機のグループ化等を入力設定することができるようになっている。運転スケジュールは、全ての室内機において共通であってもよいし、グループ毎に設定されていてもよい。

【0015】

また、中央制御装置3は、少なくとも2つの外部入力接点（図示略）を有しており、1つの外部入力接点には図1に示したタイマ装置4が接続され、もう一つの外部入力接点には図1に示した電力計が接続されており、電力量の計測を実施している。本来、前者のタイマ装置用の外部入力接点は、緊急時に全ての空調機を停止させる緊急停止制御入力用、もしくは電力量が規定値を超えた場合に、電力量を下げる制御を実施するためのデマンド入力用として中央制御装置3に接続されたものであり、本実施形態においては、この外部接点を料金計算のために用いる。つまり、本実施形態では、異なる用途のために予め決められていた中央制御装置3の外部接点を料金計算のために代用するものである。

【0016】

具体的には、外部接点が開状態から閉状態に変化した場合に、検出すると、入力信号がオフからオンに切り替えられた場合に、特許制御開始入力と判断していたところ、この外部入力に関するソフトウェアが変更されることにより、外部接点が閉状態から開状態に変化した場合に、検出するように、定時の時間帯から定時外の時間帯に切り替わったと判断するようになっている。

【0017】

タイマ装置4は、時間帯に応じて出力する信号を切り替えるように構成されている。具体的には、タイマ装置4は、時間帯と出力する信号とが関連付けられたスケジュール情報を有しており、このスケジュール情報に基づいて出力信号を切り替える。例えば、タイマ装置4は、図3に示されるように、1日においてオフ信号（第1の信号）を出力する時間帯と、オン信号（第2の信号）を出力する時間帯とが登録されたスケジュール情報を有している。ここでは、定時の時間帯にオフ信号を、定時外の時間帯にオン信号が出力されるようにスケジュールングされている。

【0018】

図3の例では、スケジュール情報は、平日、土曜日、休曜日の3パターン設けられており、平日は、8時から17時までが定時、土曜日は8時から14時までが定時、休曜日は終日定時外とするスケジュール情報が登録されている。なお、上記オン信号とオフ信号とは逆に設定されていてもよい。

【0019】

また、本実施形態に係る中央制御装置3は、上記タイマ装置4から入力される信号に基づいて、各室内機2の空調使用料金を計算する機能（料金計算手段）を備えている。また、中央制御装置3には、外部入力端子を介してマルチ型空調装置の電力消費量が入力されるようになっている。

【0020】

具体的には、中央制御装置3は、定時の時間帯に対応する課金係数 K_1 円/kWh及び

(5)

特開2016-38377(2016-38377A)

定時外の時間帯に対応する課金係数 $K2$ 円/kWhを備有しており、これらの課金係数 $K1$ 、 $K2$ をタイマ4から入力される信号に基づいて選択し、選択した課金係数 $K1$ 、 $K2$ をその時間帯における消費電力に乘算することで空調使用料金を計算する、

【0021】

例えば、中央制御装置3は、CPU（中央演算装置）、ROM（Read Only Memory）、RAM（Random Access Memory）等を備えており、例えば、ROMには、タイマ装置4から入力される信号に基づいて空調使用料金を計算するための処理手順がプログラムの形式で格納されている。このプログラムをCPUがRAM等に読み出して実行することにより、後述する料金計算を実現させる。

【0022】

次に、上記構成を示すマルチ型空調装置における空調料金の計算方法について説明する。

まず、タイマ装置4は、図3に示したスケジュール情報に基づいて、現在の時間帯に応じた信号を中央制御装置4に出力する。これにより、定時の時間帯にはオン信号が定時外の時間帯にはオフ信号が出力される。

【0023】

中央制御装置3には、タイマ装置4からの信号に基づいて定時の時間帯か否かを判定し、この判定結果に応じた課金係数を選択する。そして、取得した課金係数を外部入力端子を介して入力されるマルチ型空調装置の電力消費量に乘算することで、空調使用料金を算出する。

図4(a)乃至(c)は、定時の時間帯と定時外の時間帯とで区分された平日、土曜日、休曜日の消費電力量をそれぞれ示した図である。

【0024】

これにより、例えば、平日における定時の時間帯の消費電力が $C11$ kWh、定時外の時間帯の消費電力が $C12$ kWh、土曜日の定時の時間帯の消費電力が $C21$ kWh、定時外の時間帯の消費電力が $C22$ kWh、休曜日の定時外の時間帯の消費電力が $C33$ kWhとすると、1週間における定時の時間帯の電気料金及び定時外の時間帯の電気料金は、以下のように計算される。

【0025】

定時の時間帯における電気料金： $K1 \times (C11 + C21)$ 円

定時外の時間帯における電気料金： $K2 \times (C12 + C22 + C33)$ 円

【0026】

このようにして、電気料金が求められた後は、例えば、各室内機の使用時間等に応じて電気料金が配分されることで、各室内機の使用料金、更には、各テナントへの請求料金が確定することとなる。

【0027】

以上、説明してきたように、本実施形態に係る空調料金の計算装置によれば、中央制御装置が有する既存の外部接続点にタイマ装置4を接続し、タイマ装置4から入力される開閉信号（オン・オフ信号）に基づいて定時の時間帯か否かを判定することとしたので、中央制御装置において煩雑な処理を行うことなく、簡便な処理及び比較的少ないメモリ容量で空調使用料金の計算を行うことができる。

また、緊急停止等を使用される目的で予め設けられていた外部接続点を代用することにより、簡便なソフトウェアの変更を行うだけで、空調使用料金の計算を中央制御装置3において実現させることができる。これにより、設計変更に伴う時間や労力を削減することができる。

【0028】

なお、上記実施形態においては、異なる用途を目的として、中央制御装置3に予め設けられていた外部接続点を介してタイマ装置4からの信号を入力することとしたが、これに代えて、他の通信ポートや他の通信媒体を介して中央制御装置3とタイマ装置4との間の通信を行うこととしてもよい。また、タイマ装置4の機能も中央制御装置3内に設けること

(b)

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としてもよい。

【0029】

更に、本実施形態では、定時の時間帯が否かにより課金係数を切り替えることとしているが、時間帯を細分化し、細分化したそれぞれの時間帯に対応する互いに異なる出力信号をスケジュール情報に登録しており、また、各時間帯に対応する課金係数を課金テーブルに登録しておくことで、より細かい課金を行うことが可能となる。

上記互いに異なる出力信号としては、例えば、周波数等がそれぞれ異なるデジタル信号を使用することができる。

【0030】

また、本実施形態では、中央制御装置に空調使用料金の計算機能を持たせた場合について説明したが、マルチ型空調制御装置に通信媒体を介して接続される装置を新たに設け、この装置に上述した空調使用料金の計算機能を持たせ、料金計算手段として機能させることもとしてもよい。

また、本実施形態では、中央制御装置に電力量計を接続する場合について述べたが、空調制御機がガスヒートポンプの場合には、電力量計に代えてガス流量計が接続されてもよい。

【図面の簡単な説明】

【0031】

【図1】本発明の一実施形態に係る空調料金計算装置及び該空調料金計算装置が適用されるマルチ型空調制御システムの全体構成を示したブロック図である。

【図2】図1に示した中央制御装置の構成構成を示した図である。

【図3】スケジュール情報の一例を示した図である。

【図4】タイマ装置からの信号に基づいて消費電力量を定時と定時外に区分した図である。

【符号の説明】

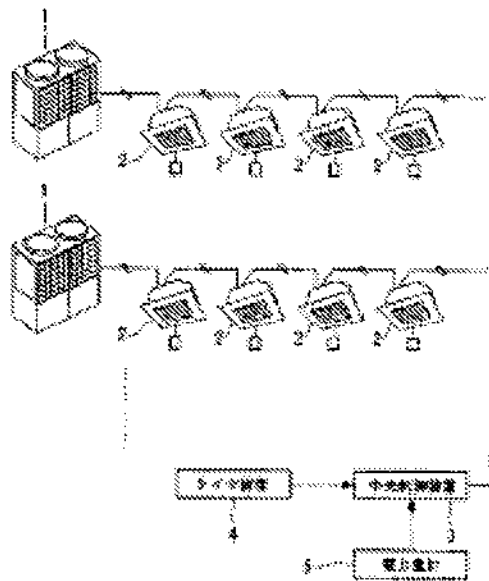
【0032】

- 1 室外機
- 2 室内機
- 3 中央制御装置
- 4 タイマ装置
- 5 電力量計
- 31 表示部
- 32 入力部

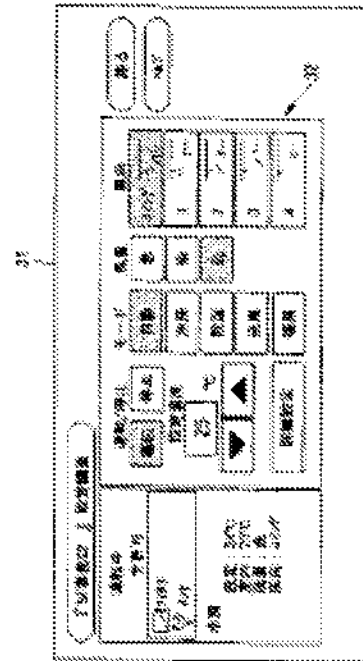
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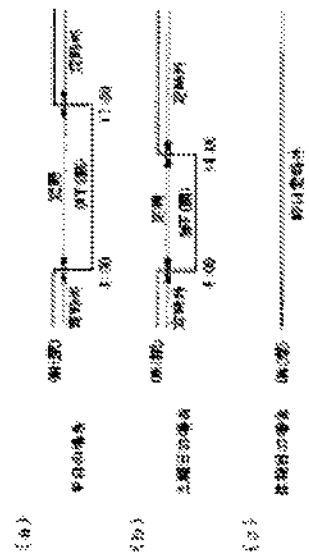
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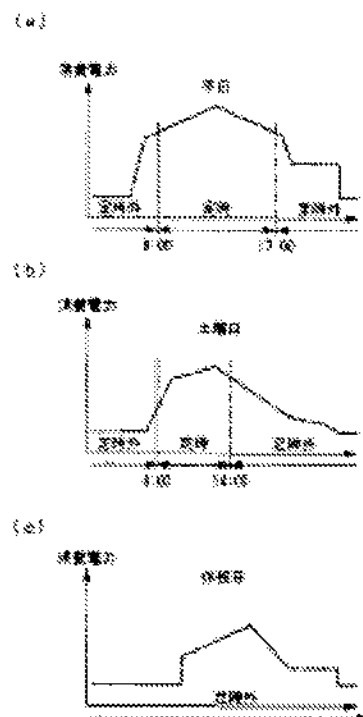
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特開2010-38377(P2010-38377A)



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Bibliographic data: JP2010286218 (A) — 2010-12-24

AIR CONDITIONING RATE CALCULATION DEVICE AND AIR CONDITIONING RATE CALCULATION METHOD

No documents available for this priority number.

Inventor(s): HIRAMATSU SEIJI ± (HIRAMATSU SEIJI)

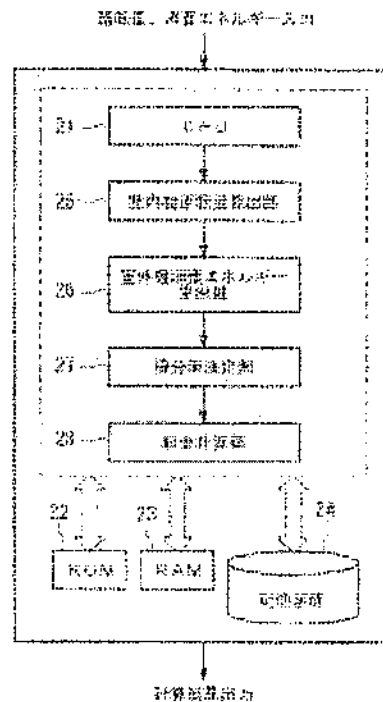
Applicant(s): MITSUBISHI HEAVY IND LTD ± (MITSUBISHI HEAVY IND LTD)

Classification: - international: **F24F11/02**
- cooperative:

Application number: JP20090142184 20090615

Priority number(s): JP20090142184 20090615

Abstract of JP2010286218 (A)



PROBLEM TO BE SOLVED: To perform appropriate proportional rate division with respect to the standby power of an outdoor unit. ; SOLUTION: The air-conditioning-rate calculation device 5 for proportionally dividing the utility rate of an air conditioning system constituted by connecting a plurality of indoor units connected to at least one outdoor unit or including a plurality of refrigerant systems to each of the indoor units or a user of each indoor unit includes: a first calculation means 25 which calculates an operation quantity of each of the plurality of indoor units; a second calculation means 26 which calculates a consumed energy quantity of the outdoor unit; a proportional division rate determination means 27 which determines a proportional division rate of the consumed energy quantity of the outdoor unit based on the operation quantity of each indoor unit; and a rate calculation means 28 which calculates a utility rate of the outdoor unit based on the consumed energy quantity of the outdoor unit and the proportional division rate. ; COPYRIGHT: (C)2011,JPO&INPIT

Last updated: 09.10.2013 Worldwide Database 5.8.11.5; 93p

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(71) 出願人 000052189

三菱重工業株式会社

東京都港区港東二丁目16番5号

(72) 代理人 100112737

弁護士 藤田 孝雄

(73) 代理人 100113913

弁護士 上田 邦彦

(74) 発明者 平松 純司

東京都港区港東二丁目16番5号 三菱重

工業株式会社内

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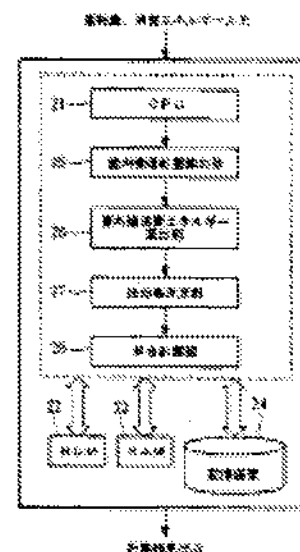
(54) 【発明の名称】空調料金計算装置及び空調料金計算方法

(57) 【要約】

【課題】室外機の総機電力について適正な料金按分をすることを目的とする。

【解決手段】少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖システムを備える空調システムの使用料金を、前記各室内機又は前記各室内機の使用者に按分する空調料金計算装置であって、複数の室内機の運転量をそれぞれ算出する第1算出手段25と、室外機の消費エネルギー量を算出する第2算出手段26と、各室内機の運転量に基づいて、前記室外機の消費エネルギー量の按分率を決定する按分率決定手段27と、室外機の消費エネルギー量と前記按分率とに基づいて前記室外機の使用料金を計算する料金計算手段28と、を備える。

【発明】図2



(2)

特許2010-286218 (P.2010-286218A)

【特許請求の範囲】

【請求項1】

少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖房システムを備える空調システムの使用料金を、前記各室内機又は前記各室内機の利用者に按分する空調料金計算装置であって、

前記複数の室内機の運転量をそれぞれ算出する第1算出手段と、

前記室外機の消費エネルギー量を算出する第2算出手段と、

前記各室内機の運転量に基づいて、前記室外機の消費エネルギー量の按分率を決定する按分率決定手段と、

前記室外機の消費エネルギー量と前記按分率とに基づいて前記室外機の使用料金を計算する料金計算手段と、

を備えたことを特徴とする空調料金計算装置、

【請求項2】

少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖房システムを備える空調システムの使用料金を、前記各室内機又は前記各室内機の利用者に按分する空調料金計算装置であって、

前記複数の室内機の運転量をそれぞれ所定期間毎に算出する第1算出手段と、

前記室外機の消費エネルギー量を所定期間毎に算出する第2算出手段と、

前記所定期間毎の各室内機の運転量に基づいて、前記所定期間毎の前記室外機の消費エネルギー量の按分率を決定すると共に、所定期間のうち第1の所定期間の前記各室内機の運転量が零である場合に、所定期間のうち第2の所定期間における前記各室内機の運転量に基づいて、前記第1の所定期間の前記室外機の消費エネルギー量の按分率を決定する按分率決定手段と、

前記室外機の消費エネルギー量と前記按分率とに基づいて前記室外機の所定期間毎の使用料金を計算する料金計算手段と、

を備えたことを特徴とする空調料金計算装置、

【請求項3】

前記按分率決定手段は、前記第1の所定期間及び前記第2の所定期間の前記各室内機の運転量が零である場合に、所定期間のうち第3の所定期間における前記各室内機の運転量に基づいて、前記第1の所定期間の前記室外機の消費エネルギー量の按分率を決定することを特徴とする請求項2に記載の空調料金計算装置、

【請求項4】

前記所定期間が一日間であり、かつ、前記第2の所定期間が前記第1の所定期間の翌日又は前日であることを特徴とする請求項3に記載の空調料金計算装置、

【請求項5】

前記第3の期間は、前記第2の期間以降又は以前の前記各室内機の運転量が零とならない日であることを特徴とする請求項3又は請求項4に記載の空調料金計算装置、

【請求項6】

少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖房システムを備える空調システムの使用料金を、前記各室内機又は前記各室内機の利用者に按分する空調料金計算方法であって、

前記複数の室内機の運転量をそれぞれ算出する第1算出ステップと、

前記室外機の消費エネルギー量を算出する第2算出ステップと、

前記各室内機の運転量に基づいて、前記室外機の運転量の按分率を決定する按分率決定ステップと、

前記室外機の消費エネルギー量と前記按分率とに基づいて前記室外機の使用料金を計算する料金計算ステップと、

を備えたことを特徴とする空調料金計算方法、

【請求項7】

(3)

特許第709-296213(192019-296213A)

少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖房システムを備える空調システムの使用料金を、前記各室内機又は前記各室内機の使用者に按分する空調料金計算方法であって、

前記複数の室内機の運転量をそれぞれ所定期間毎に算出する第1算出ステップと、

前記室外機の消費エネルギー量を所定期間毎に算出する第2算出ステップと、

前記所定期間毎の各室内機の運転量に基づいて、前記所定期間毎の前記室外機の消費エネルギー量の按分率を決定すると共に、所定期間のうち第1の所定期間の前記各室内機の運転量が零である場合に、所定期間のうち第2の所定期間における前記各室内機の運転量に基づいて、前記第1の所定期間の前記室外機の消費エネルギー量の按分率を決定する按分率決定ステップと、

前記室外機の消費エネルギー量と前記按分率とに基づいて前記室外機の所定期間毎の使用料金を計算する料金計算ステップと、

を備えることを特徴とする空調料金計算方法。

【技術分野】

【0001】

本発明は、空調料金計算装置に係り、特に、少なくとも一つの室外機と複数の室内機とを有する空調システムを集中管理し、該空調システムの消費エネルギーにかかる料金を按分計算する空調料金計算装置に関するものである。

【背景技術】

【0002】

従来より、少なくとも一つの室外機に対して複数の室内機を接続して構成される1または複数の冷暖房システムを備えるマルチ空調システムが知られている。そして、オフィスビルやテナントビル等では、このようなマルチ空調システムを集中管理して、複数の室内機の使用料金をそれぞれに対して空調システムの使用料金を按分することが行われている。

例えば、特許文献1には、一台又は複数台の室外ユニットと複数台の室内ユニットとを接続して構成される複数の冷暖房システムを備える空調システムにおいて、各冷暖房システムの運転制御および全冷暖房システムで消費する全エネルギー消費量を各冷暖房システム毎に按分し、さらに、それぞれの室内ユニット毎に按分させることで、各冷暖房システム毎に運転状態が異なっても適正な料金按分を行う技術が開示されている。

【図面の簡単な説明】

【0003】

【図1】本発明の実施形態に係る空調料金計算装置が適用される空調システムの概略構成を示すブロック図である。

【図2】本発明の実施形態に係る空調料金計算装置の概略構成を示すブロック図である。

【図3】本発明の実施形態に係る空調料金計算装置にかかる記憶装置に記憶される運転時間及び消費電力量の例を示す図表である。

【図4】本発明の実施形態に係る空調料金計算装置にかかる空調料金計算処理の流れを示すフローチャートである。

【符号の説明】

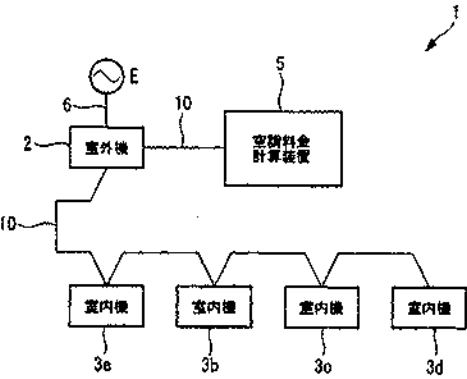
【0004】

- 1 空調システム
- 2 室外機
- 3a～3d 室内機
- 4 空調料金計算装置
- 25 室内機運転量算出部
- 26 室外機消費エネルギー算出部
- 27 按分率決定部
- 28 料金計算部

(4)

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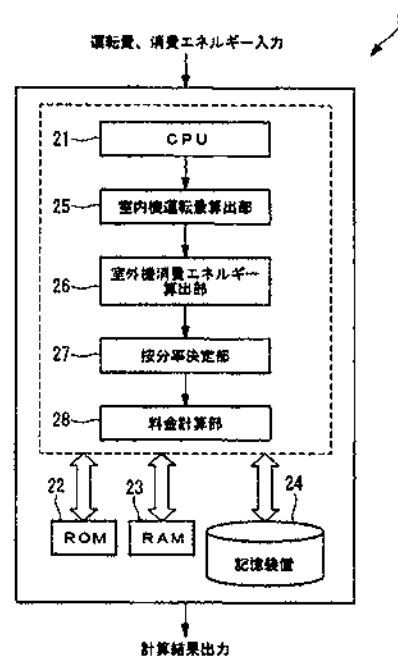
【図1】



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【図2】



(6)

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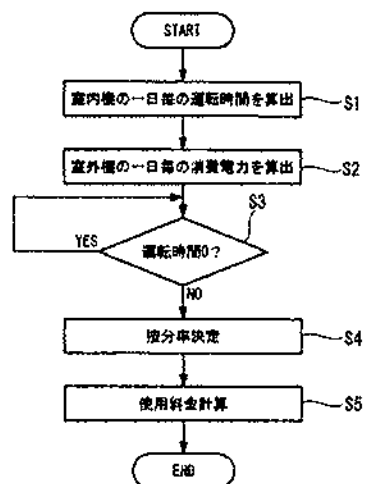
【図3】

年月日	室外機	室内機3a	室内機3b	室内機3c	室内機3d
2009年4月24日	10kw	0	0	0	0
2009年4月25日	30kw	0	0	0	0
2009年4月26日	20kw	0	20h	0	10h
4月分	60kw		40h		20h

(7)

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【図4】



(8)

特開2010-286218 (P2010-286218A)

KOREAN PATENT ABSTRACTS XSL 1111

Print Save Error Report

(10) KOREAN INTELLECTUAL PROPERTY OFFICE

KOREAN PATENT ABSTRACTS

(11) Registration number: 100285833 B1
 (45) Issue date: 16.04.2001
 (24) Registration date: 08.01.2001

(21) Application number: 1019980005162 (73) Proprietor:
 (22) Application date: 19.02.1998 (72) Inventor: ● CHOI, GWANG SU
 (51) Int. Cl.: F24F 11/02

(54) AIR CONDITIONER WITH METERING FUNCTION AND METHOD FOR CONTROLLING OPERATION OF AIR CONDITIONER

(57) Abstract:

PURPOSE: An air conditioner with metering function and its control method is provided to prevent power waste by displaying the power consumption and corresponding electric charge.

CONSTITUTION: An air conditioner comprises a key input unit(110) for permitting a user to input operation command and set a target electric charge, a temperature sensing unit(160) for sensing the indoor temperature, a load driving unit(140) for performing cooling or heating operation by driving a compressor and motor, a power detection unit(120) for detecting power consumed during cooling or heating operation, a micro computer(130) for controlling operation of the load driving unit in accordance with the operation command input through the key input unit and the indoor temperature sensed by the temperature sensing unit, calculating an electric charge and estimated electric charge from the power detected by the power detection unit, and controlling operation of the load driving unit in accordance with the result of comparison between the target electric charge and the estimated electric charge, and a display unit(150) for selectively displaying the operation state, electric charge and estimated electric charge in accordance with the control of the micro computer.

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☞ For more registration information

Legal Status

No.	Receipt/Delivery No.	Receipt/Delivery Date	Document Title (KOR.)	Status (KOR.)
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0138

1	1-1-1995-0015443-41	1995.02.19	Request for Examination (출원심사청구서)	Acceptance {수신}
2	1-1-1995-0015443-50	1995.02.19	Patent Application (특허출원서)	Acceptance {수신}
3	1-1-1995-0015443-05	1995.02.19	Notification of assignment of agent (대리인명정당통지서)	Acceptance {수신}
4	4-1-1999-0002975-52	1999.01.08	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
5	4-1-1999-0027796-82	1999.05.03	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
6	4-1-1999-0119999-71	1999.09.18	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
7	4-1-2000-0109999-21	2000.06.09	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
8	9-5-2000-0005036-79	2000.08.21	Notification of reason for refusal (외국특허거절통지서)	Dispatched (보내고의통지)
9	1-1-2000-5317812-01	2000.10.19	Written Opinion (의견서)	Acceptance {수신}
10	1-1-2000-5317818-07	2000.10.19	Amendment to Description, etc. (특허사정보정서)	Acceptance of amendment (보정수신)
11	9-5-2000-0001588-94	2000.12.21	Decision to grant (발특시정서)	Dispatched (발고특시통지)
12	4-1-2002-0009038-05	2002.04.30	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
13	4-1-2002-0079231-78	2002.10.11	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
14	4-1-2003-0000908-25	2003.01.07	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
15	4-1-2003-5079288-83	2003.12.02	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
16	4-1-2005-5072286-11	2005.07.15	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
17	4-1-2005-5079334-14	2005.08.02	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}
18	4-1-2012-5132600-40	2012.06.01	Notification of change of applicant's information (출원인정보변경(명칭)신고서)	Acceptance {수신}

(19) **KOREAN INTELLECTUAL PROPERTY OFFICE**

KOREAN PATENT ABSTRACTS

(11) Publication number: **1020000059532 A**

(43) Publication date: **05.10.2000**

(21) Application number: **1019990007184**

(71) Applicant:

• **DONGHAE SYSTEMS
INC.**

(22) Application date: **04.03.1999**

(72) Inventor:

• **KIM, DONG SIK**

(51) Int. Cl: **F04D 27/00**

(54) CONTROLLER OF OPERATION OF VENTILATION FAN

(57) Abstract:

PURPOSE: A controller of operation of a ventilation fan is provided to maintain a uniform temperature by automatically controlling a velocity of the ventilation fan according to temperature and automatically detect and determine abnormal operation by a microprocessor for preventing accidents in advance.

CONSTITUTION: A controller of operation of a ventilation fan includes a DC motor(1) of which rotation velocity varies in proportion to the power supply voltage by using a permanent magnet, a thermistor(2) for changing the voltage according to temperature, a ventilation fan velocity control part(3) for selecting modes with jumper pin(6) according to a plurality of change values stored in a microcomputer, an A/D converter for converting the voltage detected by the thermistor to digital values to input to the microcomputer, an alarm control part(8) for controlling LEDSs(9), a speaker(10), an error-in lamp(11), and an error-out lamp(12) to represent normal or abnormal temperatures by analyzing the input data from the A/D converter.

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Legal Status

No.	Receipt/Delivery No.	Receipt/Delivery Date	Document Title (KOR.)	Status (KOR.)
1	1-1-1999-0017820-64	1999.03.04	(출원서)	Acceptance (수리)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
1 December 2011 (01.12.2011)(10) International Publication Number
WO 2011/149600 A3(51) International Patent Classification:
F24F 11/02 (2006.01) H04Q 9/04 (2006.01)(21) International Application Number:
PCT/US2011/032537(22) International Filing Date:
14 April 2011 (14.04.2011)

(25) Filing Language: English

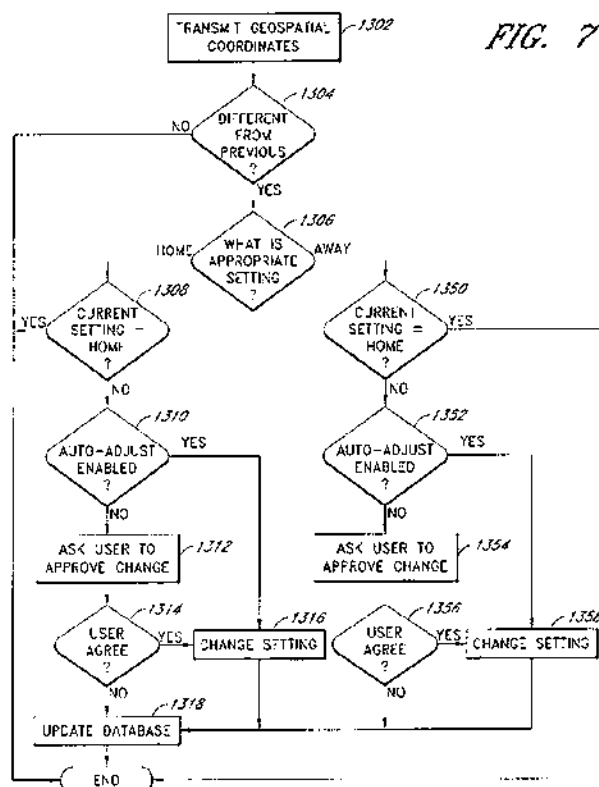
(26) Publication Language: English

(30) Priority Data:
12/788,246 26 May 2010 (26.05.2010) US(71) Applicant (for all designated States except US): ECO-
FACTOR, INC. [US/US]; 423 Broadway, #801, Mill-
brae, CA 94030 (US).

(72) Inventor: and

(75) Inventor/Applicant (for US only): STEINBERG, John,
Douglas [US/US]; 873 Hacienda Way, Millbrae, CA
94030 (US).(74) Agent: KING, John, R.; Knobbe, Martens, Olson &
Bear, LLP, 2040 Main Street, 14th Floor, Irvine, CA
92614 (US).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR USING A MOBILE ELECTRONIC DEVICE TO OPTIMIZE AN ENERGY MAN-
AGEMENT SYSTEM

(57) Abstract: Embodiments of the invention comprise systems and methods for using the geographic location of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one mobile electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

WO 2011/149600 A3

WO 2011/149600 A3



LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))*

Declarations under Rule 4.17:

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a patent (Rule 4.17(ii))*

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Published:

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/032537**A. CLASSIFICATION OF SUBJECT MATTER****F24F 11/02(2006.01), H04G 9/04(2006.01)**

According to International Patent Classification (IPC) or to both national classifications and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F 11/02, H04G 9/04, G05D 23/00, F25B 9/00

Documentation consulted other than minimum documentation for the extent that such documents are included in the fields searched

Receptivity models and applications for utility models

Appropriability models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)


eKOMPASS(KIPO Internal); & Keywords: mobile, geographic, location, temperature

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of its relevant passages	Relevant to claim No.
4	EP 2006-081403A1 (GILLES, RENE et al.) DE September 2006 See Column 1:2-1:25	1-22
4	EP 1901-017000A1 (MILNER, L. / MORGAN, R. et al.) DE September 2001 See Column 1:24-1:25	1-22

☐ Further documents included in the examination of Item C.☒ See prior art by annex

* Special categories of cited documents	* Other documents published after the international filing date or priority date and not to conflict with the application but cited to understand the principle in theory, underlying the invention
(1) Document belonging to the general state of the art which must be considered in view of public disclosure	(2) Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
(2) Other applications or papers not published on or after the international filing date	(3) Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is compared with one or more other such documents such combination being obvious to a person skilled in the art
(3) Document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason or specific effect	(4) Document member of the same patent family
(4) Document referring to known disclosure, use, existence or other facts	
(5) Document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of issuing of the international search report
12 DECEMBER 2011 (12.12.2011)	12 DECEMBER 2011 (12.12.2011)
Name and mailing address of the ISA/KR	Authorized officer
 Korea Intellectual Property Office Changwon Changwon-Daegu, 630 Changwon Seo-gu, Daegu 702-701, Republic of Korea	LANG, G. J. H. B. N. G.
Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-5495

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/032537

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006-0214014 A1	28.09.2006	US 7640760 B2	05.01.2010
US 2004 0176880 A1	09.09.2004	AT 355734 T	15.04.2007
		AT 399110 T	15.07.2008
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		US 6330497 B1	11.12.2001
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		US 6859687 B2	22.02.2005
		US 6922616 B2	26.07.2005

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/032537

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 7052362 B2	13.06.2006
		US 7124004 B2	17.10.2006
		US 7171291 B2	30.01.2007
		US 7439778 B2	03.03.2009
		WO 98-34812 A2	13.08.1998
		WO 98-34812A2	13.08.1998
		WO 98-34812A3	05.11.1998
		WO 98-34812A3	05.11.1998

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(30) World Intellectual Property
Organization
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23 February 2012 (23.02.2012)

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H04L 12/12 (2006.01)

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(22) International Filing Date:

18 August 2011 (18.08.2011)

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English

(30) Priority Data:

12-860,822 29 August 2010 (29.08.2010) US

(71) Applicant (for all designated States except US): ECO-
FACTOR, INC. [US/US]; 412 Broadway, #904, Millbrae,
CA 94030 (US).

(72) Inventor: and

(75) Inventor/Applicant (for US only): STEINBERG, John,
Douglas [US/US]; 873 Hacienda Way, Millbrae, CA
94030 (US).(74) Agent: KIM, John, R.; Knobbe, Martens, Olson & Bear,
LLP, 2080 Main Street, 18th Floor, Irvine, CA 92614
(US).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PG, PH, PL, PT, QA, RO, RU, RW, SA, SD, SE,
SG, SK, SL, SM, ST, SY, SZ, TH, TJ, TM, TN, TR, TT,
TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AE, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SK, SM,
SI), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, NG, TD, TG).

Declarations under Rule 4.17:

--- in to applicant's entitlement to apply for and be granted a
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Published:

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--- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
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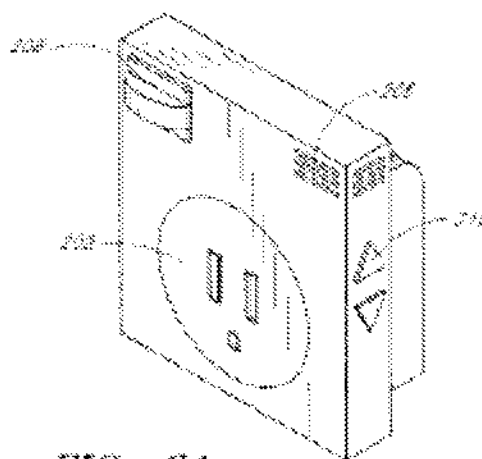
(54) Title: SYSTEM AND METHOD FOR OPTIMIZING USE OF FLAG-IN AIR CONDITIONERS AND PORTABLE HEAT-
ERS

FIG. 3A

(57) Abstract: Thermostatic HVAC and other energy management controls that are connected to a computer network. For instance, remotely managed load switches incorporating thermostatic controllers inform an energy management system, to provide enhanced efficiency, and to verify demand response with plug-in air conditioners and heaters. At least one load control device at a first location comprises a temperature sensor and a microprocessor. The load control device is configured to connect or disconnect electrical power to the air conditioned air conditioner or heater, and the microprocessor is configured to communicate over a network. In addition, the load control device is physically separate from an air conditioner or heater but located inside the space conditioned by the air conditioner or heater.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/048316**A. CLASSIFICATION OF SUBJECT MATTER***F24F 11/02(2006.01), H04L 12/12(2006.01), H04L 12/16(2006.01)*

According to International Patent Classification (IPC) or to both national classifications and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F 11/02, H04L 12/12, F24F 11/06, F24F 11/08, F24F 11/10, F24F 11/14

Documentation searched other than minimum documentation for the extent that such documents are included in the fields searched

Relevant utility models and applications for utility models

Irrelevant utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search term used)


eKOMPASS(KIPO Internal); & Keywords: control, responsive, compare, database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of its relevant passages	Relevant to claim No.
1	KR 10-1984-0011443 A (Korea: Digital Co., et al.) 10 June 1984 See Abstract, Claim 1	1-13
2	KR 10-2000-0006222 A (Korea: System Co.) 13 October 2000 See Claim 2, 4	1-13
3	EP 0510047 A2 (IBM, ILL. & CO., INC. et al.) 08 March 1993 See Claim 1	1-13
4	EP 2008-019745 A1 (DAVIDSON WPI, et al.) 21 August 2008 See Claim 1, Page 4, Para. 67, 83	1-13

☐ Further documents included in the examination of Item C.☒ See prior artly annex

* Special categories of cited documents	* Prior document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle in theory underlying the invention
* Document defining the general state of the art which must be considered in view of public disclosure	* Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
* Other applications or patent not published on or after the international filing date	* Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is compared with one or more other such documents such combination being obvious to a person skilled in the art
* Document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason as specified	* Document member of the same patent family
* Document referring to known disclosure, use, existence or other facts	
* Document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of issuing of the international search report
27 MARCH 2012 (27.03.2012)	09 APRIL 2012 (09.04.2012)
Name and mailing address of the ISA/KR	Authorized officer
 Korea Intellectual Property Office Changwon Changwon-Daegu, 630 Changwon-ro Seo-gu, Daegu 702-701, Republic of Korea	LANG, G. J. HUNG
Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-5495



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/048316

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-1994-0011902 A	22.03.1994	None	
KR 10 2000 0059532 A	05.10.2000	None	
EP 0415747 A2	06.03.1991	CA 2024221 A1 CN 1050762 A EP 0415747 A3 JP 03-09915C A NZ235064A US 05058388A A	01.03.1991 17.04.1991 15.01.1992 24.04.1991 25.02.1993 22.10.1991
US 2008 0198549 A*	21.03.2008	AU 2007 207648 A1 CA 2637351 A1 CN 101385408 A EP 1974592 A2 JP 2009-524151 A KR 10-2008-C097200 A US 2007-0163748 A1 US 2007-0165377 A1 US 2007-0167125 A1 US 2009-0259343 A1 US 7335973 B2 WO 2007-084489 A2 WO 2007-084489 A3	26.07.2007 26.07.2007 11.03.2009 01.10.2008 25.06.2009 04.11.2008 19.07.2007 19.07.2007 19.07.2007 15.10.2009 29.04.2008 26.07.2007 26.07.2007

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(39) World Intellectual Property
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International Bureau(19) International Publication Number
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19 December 2013 (19.12.2013)

(51) International Patent Classification

F23F 11/02 (2006.01); G06Q 30/06 (2012.01)
G06D 23/00 (2006.01)

(11) International Application Number:

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(22) International Filing Date:

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(25) Filing Language:

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(26) Publication Language:

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(30) Priority Data:

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(71) Applicant: ECOFACTOR, INC. [US/US]; 421 Broadway,
#801, Millbrae, CA 94030 (US)(72) Inventors: HUBBOLD, Scott Douglas; 241 Lakewood
Way, Redwood City, CA 94062 (US); STEINBERG,
John Douglas; 877 Baccata Way, Millbrae, CA 94030
(US)(74) Agent: KING, John R. Knibbe, Martens, Olson & Bear,
LLP, 2040 Main Street, 14th Floor, Irvine, CA 92614
(US)(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, FR, GB, GR, GU, GM, GT,
HN, HR, HU, ID, IL, IN, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LV, LY, MA, MK,
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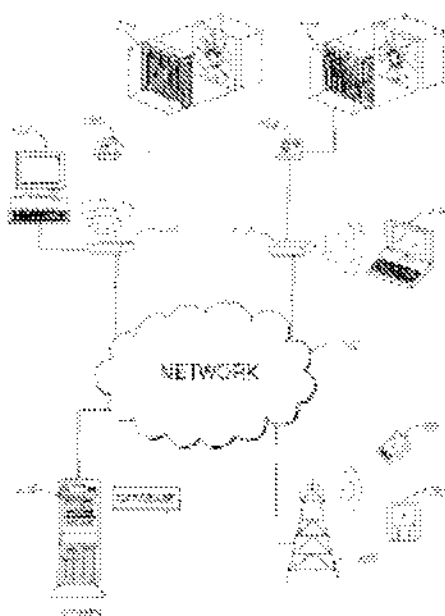
(54) Title: SYSTEM AND METHOD FOR OPTIMIZING USE OF INDUSTRIAL HVAC UNITS IN MULTI-UNIT CHILLER-
BASED SYSTEMS

FIG. 2

(57) Abstract: Systems are disclosed for allocating the cost of operating an HVAC system of a multiunit structure. The HVAC system comprises at least a first component that consumes energy based on thermostat settings in a particular unit of the multiunit structure. In addition, associated with the multiunit structure, is a second component such as a central heating and air conditioning unit. The run time associated with the first component as reported by the thermostat controller is used as a determinant of the cost of operation of the second component.

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SYSTEM AND METHOD FOR OPTIMIZING USE OF INDIVIDUAL HVAC UNITS
IN MULTI-UNIT CHILLER-BASED SYSTEMS

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] This invention relates to the use of thermostatic HVAC controls that are connected to a computer network. More specifically, the present invention pertains to the use of communicating thermostats to inform an energy management system, to accurately allocate operational costs across multiple users in a multi-user and/or multi-tenant context, to provide enhanced efficiency, and to verify demand response.

[0002] People have sought to control the temperature inside buildings using a variety of approaches for thousands of years. For most of that time, heating has been much easier to accomplish than cooling. The adoption of vapor-compression-based systems in the early part of the 20th century made it common for the first time to reliably chill inside environments well below ambient temperatures. This technological advance led to major changes in architecture (windows in many commercial buildings transmit light, but are no longer used to admit airflow), in society (enabling the development of cities in places previously inhospitable to most human preferences), and in dependence on energy from fossil fuels.

[0003] The HVAC systems used in most single-family residences today are generally different from those used in larger buildings. In residential and automotive systems, a refrigerant (formerly chlorofluorocarbons such as Freon, but today a number of different materials are used due to the ozone-depleting characteristics of CFCs) circulates between a mechanical compressor and an evaporator located inside the space to be conditioned, or in ductwork connected to the conditioned space. When operated as an air conditioner, the compressor converts the refrigerant from gaseous to liquid form, thereby extracting considerable heat from it. That heat is then transferred to the outside air. The newly chilled liquid is then circulated to the evaporator under high pressure through insulated tubing. Once it reaches the evaporator, which is located inside an air handler in which the air is conditioned by being forced past the evaporator

by a fan, the pressure on the liquid is removed, at which point the liquid re-converts into a gas, thereby absorbing heat from the air being blown across the evaporator. The refrigerant is then transported in gaseous form back to the compressor to repeat the cycle. Thus heat is transferred from the air in the conditioned space to the refrigerant, and then from the refrigerant to the outside air.

[0004] Many HVAC systems in large buildings include upsized versions of this type of system. Others use different technologies, such as absorption chillers, which require less electricity, but instead require a significant heat source.

[0005] Because these systems work primarily by moving heat rather than by creating it, many modern systems can also in effect “work backwards” – that is, rather than transfer heat from the air in the conditioned space and transfer it to the refrigerant and then the outside air, these systems, known as heat pumps, can collect heat from the outside air and transfer it to the refrigerant and then to the conditioned space. Thus many buildings can use the same system to deliver both cooling and heating.

[0006] In the single-family residential and automotive contexts, this approach is aided by the fact that reasonably short runs of refrigerant lines between compressor and evaporator are possible. But in large, multi-tenant buildings, this approach is problematic. Long refrigerant lines are expensive and difficult to maintain. They are also lossy, so that a significant percentage of the work done by the compressor is effectively wasted before it ever chills the conditioned space.

[0007] Another difficulty with this approach is that different tenants are likely to have different preferences for inside temperature, as well as different conditions (such as solar gain, number of heat-producing machines and people inside the space, etc.) Efficiently regulating comfort in such conditions is difficult with such a system.

[0008] Because of these difficulties, a common approach in such buildings is to add a second, intermediate medium to transfer heat from a centralized plant to each conditioned space. Water is commonly used for this purpose. Relative to gases like Freon, water has extremely high thermal mass.

This property leads to several benefits in such systems. First, water's high thermal mass allows the centralized chillers to effectively store cold in advance of the need to deliver cold air in conditioned spaces, thereby permitting a small amount of load shifting. Second, when the cold water is circulated, losses are easier to control. Third, the network of low-pressure water pipes is easier to build and maintain as compared to high-pressure refrigerant lines. Fourth, the circulatory system is easily modulated in individual air handlers, enabling easier control of the distribution of cooling. And fifth, larger compressors tend to be more efficient than smaller ones, which leads to stronger preferences for centralized systems as building size increases. These systems are often referred to as chiller-based systems. Where individual systems in the single-family residential context may generally be sized from 2-4 tons of cooling capacity (24,000 – 48,000 BTU/hour), chiller-based systems are typically 15-1500 tons (180,000 to 18,000,000 BTU/h). From an overall system efficiency standpoint, these chiller-based systems can be as much as 50-100% more efficient than systems designed for single-family residences. However, these systems generally share an important drawback.

[0009] Thermal space conditioning is the largest use of energy on average in American residences. In a typical single-family residence, where heavy air conditioning use in July is followed by receipt of a large electricity bill in August, there is a delayed but more or less effective feedback loop incentivizing consumers to avoid waste. But in central chiller-based systems, a significant portion of the energy used in cooling an individual space is consumed by a central plant that may supply conditioning to as many as hundreds or even thousands of units. These systems require large motors – in large buildings, chillers often require motors that deliver hundreds of horsepower or more – that are often the largest single use of energy in the building. Determining the amount of energy properly allocated to a given unit is generally impossible. Landlords and building owners can allocate the cost based on square footage or other static means, but when price does not vary with usage, there is little or no incentive to conserve. Thus occupants tend not manage energy consumption for efficiency, and waste is common.

SUMMARY OF THE INVENTION

[0010] Thus it would be desirable to offer a system that combined the mechanical efficiency of a centrally chilled system with the ability to price the service based upon metered use of individually conditioned systems, which tends to lead to improved behavioral efficiency.

[0011] It would also be desirable to offer a system that can respond to information about the presence or absence of occupants of individual conditioned spaces within a larger structure, including information generated by mobile devices such as cell phones, and by other devices located within the conditioned spaces, such as personal computers and home entertainment systems.

[0012] It would also be desirable to offer a system that can calculate thermal properties, such as dynamic signatures, of individual conditioned spaces within a larger structure.

[0013] It would also be desirable to offer a system that can reduce energy use in individual conditioned spaces within a larger structure by offering just-in-time space conditioning.

[0014] It would also be desirable to offer a system that can adapt the programming of HVAC systems to user inputs.

[0015] It would also be desirable to offer a system that can shape and shed electrical loads related to HVAC while reducing or eliminating negative effects on occupant comfort.

[0016] It would also be desirable to offer a system that can recognize performance degradations in HVAC performance over time where a central chiller supplies multiple separate habitable spaces.

[0017] It would also be desirable to offer a system that can use data collected from one or more thermostats in different units of a multi-dwelling unit building in order to correct for anomalous or missing data from another thermostat in another unit.

[0018] It would also be desirable to offer a system that can execute specific patterns of setpoint variations on order to reduce energy consumption while minimizing adverse effects to comfort. In one embodiment, the invention comprises a chiller-based HVAC system, a networked thermostat, a local network connecting the load-control switch to a larger network such as the Internet, and a

server in bi-directional communication with such networked load-control switch and device.

[0019] In one embodiment, a system allocates the cost of operating an HVAC system where the HVAC system comprises at least a first component that consumes energy based at least in part on whether equipment associated with an individual unit of occupancy in a building comprised of a plurality of occupancy units is "on" or "off", and at least a second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not the first component is "on or "off".

[0020] The HVAC system comprises a thermostatic controller comprising a thermostat, the thermostatic controller configured to that turn on or off a first component that is associated with an individual unit of occupancy at least in part based on temperature readings from inside the individual unit of occupancy, and that is capable of reporting that the first component that is associated with the individual unit of occupancy is on or off.

[0021] The HVAC system further comprises at least a processor not located inside the individual unit of occupancy that is in communication with the thermostat and a database for storing data reported by the thermostat.

[0022] In addition, where at least the run time associated with the first component that is associated with the individual unit of occupancy as reported by the thermostatic controller is a determinant of the cost of operation of a second component that is associated with a plurality of units allocated to the individual unit of occupancy.

[0023] In yet another embodiment, the second component includes at least a central chiller. In addition, the individual unit of occupancy is an apartment. Still further, the thermostatic controller communicates at least in part via a wireless network. Moreover, the thermostatic controller communicates at least in part via the Internet.

[0024] In yet other embodiments, the medium used to transfer heat between the first component and the second component is water. Also, the medium used to transfer heat between the first component and the second component is steam. Furthermore, the individual unit of occupancy is a non-residential commercial space. In addition, the building comprises multiple stories.

[0025] An additional embodiment relates to a method for allocating the cost of operating an HVAC system where the HVAC system comprises at least a first component that consumes energy based at least in part on whether equipment associated with an individual unit of occupancy in a building comprised of a plurality of occupancy units is "on" or "off", and at least a second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not the first component is "on or "off."

[0026] The method comprises measuring the runtime of a first component with a thermostatic controller that turns on or off the first component that is associated with the individual unit of occupancy at least in part based on temperature readings from inside the individual unit of occupancy, and that is capable of reporting that the first component that is associated with the individual unit of occupancy is on or off.

[0027] The method also measures the runtime of at least the second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not the first component is "on or "off."

[0028] In addition, the method calculates the cost of operating the HVAC system to be allocated to the individual unit of occupancy based at least in part on the run time associated with the first component that is associated with the individual unit of occupancy as reported by the thermostatic controller relative to the cost of operation of the second component that is associated with a plurality of units allocated to the individual unit of occupancy.

[0029] In yet other embodiments, the second component includes at least a central chiller and the individual unit of occupancy is an apartment. Still further, the thermostatic controller communicates at least in part via a wireless network such as the Internet.

[0030] Moreover, the medium used to transfer heat between the first component and the second component is water. In an other example, the medium used to transfer heat between the first component and the second component is steam. Also, the individual occupancy units are non-residential commercial spaces. In addition, the building comprises multiple stories.

[0031] In another embodiment, a system allocates the cost of operating an HVAC system where the HVAC system comprises at least a first component

that is associated with an individual unit of occupancy in a building comprised of a plurality of occupancy units, and at least a second component that is associated with a plurality of occupancy units.

[0032] The system comprises a thermostatic controller that turns on or off the first component that is associated with the individual unit of occupancy at least in part based on temperature readings from inside the individual unit of occupancy, and that is capable of reporting that the first component that is associated with the individual unit of occupancy is on or off.

[0033] Furthermore, the system comprises at least a processor not located inside the individual unit of occupancy that is in communication with the thermostat and a database for storing data reported by the thermostat.

[0034] Where at least the run time associated with the first component that is associated with the individual unit of occupancy as reported by the thermostatic controller is a determinant of the cost of operation of the second component that is associated with a plurality of units allocated to the individual unit of occupancy.

[0035] For purposes of summarizing the disclosure, certain aspects, advantages and novel features of the inventions have been described herein. It is to be understood that not necessarily all such advantages may be achieved in accordance with any particular embodiment of the invention. Thus, embodiments of the invention may be carried out in a manner that achieves one advantage or group of advantages as taught herein without necessarily achieving other advantages as may be taught or suggested herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

[0037] Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

[0038] Figures 3a, 3b and 3c are simplified schematics of central chiller HVAC systems used in multi-unit buildings.

[0039] Figure 4 shows a high-level schematic of the thermostat used as part of an embodiment of the subject invention.

[0040] Figure 5 shows one embodiment of the database structure used as part of an embodiment of the subject invention.

[0041] Figures 6a and 6b illustrate pages of a website that may be used with an embodiment of the subject invention.

[0042] Figures 7a, 7b, 7c, 7d, 7e, 7f and 7g are flowcharts showing the steps involved in the operation of different embodiments of the subject invention.

[0043] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify the location of a potential occupant using a mobile device connected to the system.

[0044] Figure 9 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the mobile device connected to the system.

[0045] Figures 10a and 10b show how comparing inside temperature and outside temperature and other variables for a given conditioned space permits calculation of dynamic signatures.

[0046] Figure 11 is a flow chart for a high level version of the process of calculating the appropriate just-in-time turn-on time for the HVAC system in a given conditioned space.

[0047] Figure 12 is a more detailed flowchart listing the steps in the process of calculating the appropriate turn-on time in a given conditioned space for a just-in-time event.

[0048] Figures 13a, 13b, 13c and 13d show the steps shown in the flowchart in Figure 12 in the form of a graph of temperature and time.

[0049] Figure 14 shows a table of some of the data used by an embodiment of the subject invention to predict temperatures.

[0050] Figure 15 shows an embodiment of the subject invention as applied in a specific conditioned space on a specific day.

[0051] Figure 16 shows an embodiment of the subject invention as applied in a different specific conditioned space on a specific day.

[0052] Figures 17, 17-1 and 17-2 shows a table of predicted rates of change in temperature inside a given conditioned space for a range of temperature differentials between inside and outside.

[0053] Figure 18 shows how manual inputs can be recognized and recorded by an embodiment of the subject invention.

[0054] Figure 19 shows how an embodiment of the subject invention uses manual inputs to interpret manual overrides and make short-term changes in response thereto.

[0055] Figure 20 shows how an embodiment of the subject invention uses manual inputs to make long-term changes to interpretive rules and to setpoint scheduling.

[0056] Figure 21 is a flow chart illustrating the steps involved in generating a demand reduction event for a given subscriber.

[0057] Figure 22 is a flow chart illustrating the steps involved in confirming that a demand reduction event has taken place.

[0058] Figure 23 is a representation of the movement of messages and information between the components of an embodiment of the subject invention.

[0059] Figures 24a and 24b show graphical representations of inside and outside temperatures in two different conditioned spaces, one with high thermal mass and one with low thermal mass.

[0060] Figures 25a and 25b show graphical representations of inside and outside temperatures in the same conditioned spaces as in Figures 24a and 24b, showing the cycling of the air conditioning systems in those conditioned spaces.

[0061] Figures 26a and 26b show graphical representations of inside and outside temperatures in the same conditioned space as in Figures 24a and 25a, showing the cycling of the air conditioning on two different days in order to demonstrate the effect of a change in operating efficiency on the parameters measured by the thermostat.

[0062] Figures 27a and 27b show the effects of employing a pre-cooling strategy in two different conditioned spaces.

[0063] Figures 28a and 28b show graphical representations of inside and outside temperatures in two different conditioned spaces in order to

demonstrate how the system can correct for erroneous readings in one conditioned space by referencing readings in another.

[0064] Figure 29 is a flowchart illustrating the steps involved in calculating the effective thermal mass of a conditioned space using an embodiment of the subject invention.

[0065] Figure 30 is a flowchart illustrating the steps involved in determining whether an HVAC system has developed a problem that impairs efficiency using an embodiment of the subject invention.

[0066] Figure 31 is a flowchart illustrating the steps involved in correcting for erroneous readings in one conditioned space by referencing readings in another using an embodiment of the subject invention.

[0067] Figure 32 shows the conventional programming of a programmable thermostat over a 24-hour period.

[0068] Figure 33 shows the programming of a programmable thermostat over a 24-hour period using ramped setpoints.

[0069] Figure 34 shows the steps required for the core function of the ramped setpoint algorithm.

[0070] Figure 35 shows a flowchart listing steps in the process of deciding whether to implement the ramped setpoint algorithm using an embodiment of the subject invention.

[0071] Figure 36 shows the browser as seen on the display of the computer used as part of an embodiment of the subject invention.

[0072] Figure 37 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

[0073] Figure 38 is a flowchart that shows how an embodiment of the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0074] **Figure 1** shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104

connected thereto. Also connected to network 102 are mobile devices 105, and one or more server computers 106, which store information and make the information available to computers 104 and mobile devices 105. The network 102 allows communication between and among the computers 104, mobile devices 105 and servers 106.

[0075] Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols. It also includes various networks used to connect mobile and wireless devices, such as cellular networks.

[0076] When a user of an embodiment of the subject invention wishes to access information on network 102 using computer 104 or mobile device 105, the user initiates connection from his computer 104 or mobile device 105. For example, the user invokes a browser, which executes on computer 104 or mobile device 105. The browser, in turn, establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

[0077] One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) and other documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

[0078] The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

[0079] In addition to delivering content in the form of web pages, network 102 may also be used to deliver computer applications that have traditionally been executed locally on computers 104. This approach is

sometimes known as delivering hosted applications, or SaaS (Software as a Service). Where a network connection is generally present, SaaS offers a number of advantages over the traditional software model: only a single instance of the application has to be maintained, patched and updated; users may be able to access the application from a variety of locations, etc. Hosted applications may offer users most or all of the functionality of a local application without having to install the program, simply by logging into the application through a browser.

[0080] In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

[0081] In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem, a network interface card or wireless networking such as 802.11 or cellular radio-based systems. The computers include processors such as those sold by Intel and AMD. Other processors may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

[0082] Computers 104 can also be microprocessor-controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

[0083] Computers 104 and mobile devices 105 may utilize a browser or other application configured to interact with the World Wide Web or other remotely served applications. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera, Chrome or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices.

[0084] The storage medium may comprise any method of storing information. It may comprise random access memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data.

[0085] Computers 104 and 106 and mobile devices 105 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the

like, or may use simpler embedded operating systems with limited ability to run applications.

[0086] Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

[0087] Mobile devices 105 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Mobile devices 105 can use a variety of means for establishing the location of each device at a given time. Such methods may include the Global Positioning System (GPS), location relative to cellular towers, connection to specific wireless access points, or other means

[0088] **Figure 2** illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are individual air handlers 110. Each air handler may supply conditioned air to an entire apartment or unit, or multiple air handlers may be used in a given space. Each user may be connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, via a modem or gateway 112 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL), cellular radio or other method of connection to the World Wide Web. The thermostats 108 may be connected locally via a wired connection such as Ethernet or Homeplug or other wired network, or wirelessly via IEEE802.11, 802.15.4, or other wireless network, which may include a gateway 112. Server 106 contains content to be served as web pages and viewed by computers 104, software to manage thermostats 108, software to manage the operation of thermostats 108, as well as databases containing information used by the servers.

[0089] Also attached to the Network may be cellular radio towers 120, or other means to transmit and receive wireless signals in communication with mobile devices 105. Such communication may use GPRS, GSM, CDMA, EvDO,

EDGE or other protocols and technologies for connecting mobile devices to a network.

[0090] **Figure 3a** shows a simplified high-level schematic of a representative sample of one kind of chiller-based air conditioning system with which the subject invention may be used. The system includes two water loops. Secondary loop 202 absorbs heat from inside the conditioned space; primary loop 204 transfers that heat to the outside air. Chiller 206 is where the heat is exchanged between the two loops. Pumps 208a and 208b force water to move through the primary and secondary loops. Heat is transferred to the outside air in cooling tower 210, where fan 212 blows air past the water that has absorbed heat in the chiller. (Some system architectures use heat exchangers inside the cooling tower; others directly expose the water to the air.)

[0091] Water in the secondary loop emerges from the chiller and is sent to through pipes to individual air handlers 110. In some implementations, the chilled water always flows through the same path regardless of the settings of thermostats 108. If thermostat 108 is in cooling mode, then fan 214 blows air from inside the conditioned unit across the air handler, transferring heat from the air to the water being transported through the air handler 110. If thermostat 108 is in off mode, then fan 214 does not move air across the air handler, and negligible heat transfer takes place. In the simplest case, the thermostat is binary: the fan is off or it is on. Alternatively, the fan may have two or more discrete speeds, or may even be controlled by a potentiometer that permits infinite adjustment of speed within the fan's range.

[0092] **Figure 3b** shows a schematic of an alternative chiller-based HVAC system with which the subject invention may be used. The system architecture is roughly similar to the system shown in Fig 3a, but in this embodiment, there are valves 216 that may be used to divert chilled water away from air handlers 110. These valves may be controlled by thermostats 108. This approach may be used in order to, for example, allow users to run the fan without "running the air conditioner", which may increase comfort at lower cost due the well-known value of moving air in order to increase comfort in warm conditions.

[0093] With the systems shown in Figures 3a and 3b, it is possible to allocate at least a portion the energy use associated with an individual air handler with data generated by or otherwise available at each individual thermostat.

[0094] **Figure 3c** shows a schematic of an alternative chiller-based HVAC system with which the subject invention may be used. The system architecture is roughly similar to that shown in Figures 3a and 3b, but in this embodiment, there are also means for measuring the temperature of the water in the secondary loop at at least two places: temperature sensor 220a measures the temperature of the water in the secondary loop prior to circulation through heat exchangers 110 (WT1); temperature sensor 220b measures the temperature of the water in the secondary loop after circulation through heat exchangers 110 (WT2). The difference between these two (ΔWT) gives a measure of the amount of cooling accomplished by the loop overall. When the air handlers in each unit in the loop are all off and/or when the valves determining whether to route the loop through the air handlers are all set to bypass, ΔWT will be relatively small, and this baseline value may be thought of as system overhead or deadweight loss. When the air handlers in each unit in the loop are all on and/or when the valves determining whether to route the loop through the air handlers are all set to send the water through each air handler, ΔWT will be relatively large. The difference between the two cases represents a measure of the work done by the HVAC system, and can be used to calculate the energy use attributable to the units in a given loop.

[0095] Figure 3c also includes a means 222 for varying the speed of the fan in cooling tower 210. Some chiller-based systems increase efficiency under dynamic load conditions by varying the speed of the motor driving the fan (and/or by increasing or decreasing the speed with which water is pumped through the primary and/or secondary loops). A variation on the system shown in Figure 3c would be a system in which the flow rate of the water circulating between the central chiller and the individual occupancy units may be varied by increasing or decreasing the work done by the pumps that circulate the water.

[0096] **Figure 4** shows a high-level block diagram of thermostat 108 used as part of an embodiment of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a thermistor, thermal diode or

other means commonly used in the design of electronic thermostats. It includes a microprocessor 254, memory 256, a display 258, a power source 260, a relay 262, which turns the blower motor in the air handler on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the blower motor. In systems in which the thermostat controls a valve that determines the flow of water through the air handler, a relay, potentiometer or other device will control the valve.

[0097] To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. Communication means 264 may include one or more antennae 266. Thermostat 108 may also include controls 268 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function for all parts of part of the subject invention. Such controls may consist of buttons, switches, dials, etc. Thermostat 108 may also include means to vary additional system parameters, such as variable fan speed, opening and closing valves that regulate the flow of the heat transfer medium, etc. Thermostat 108 should be capable of communicating such parameters to servers 106, and of allowing remote control of such parameters as well.

[0098] The data used to manage the subject invention is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, chiller system variable database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100, user location database 1200 and such other databases as may be needed to support these and additional features. Alternatively, data may be managed using a distributed file system such as Apache Hadoop.

[0099] Users of connected thermostats 108 may create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the system. Such attributes may

include the location and size of the user's unit within a building (e.g., the southwest corner, 11th floor); the specific configuration of the air handler and other unit-specific equipment in the user's unit; the user's preferred temperature settings, whether the user is a participant in a demand response program, etc.

[0100] User personal accounts may also associate one or more mobile devices with such personal accounts. For mobile devices with the capability for geopositioning awareness, these personal accounts will have the ability log such positioning data over time in database 1200.

[0101] In one embodiment, a background application installed on mobile device 105 shares geopositioning data for the mobile device with the application running on server 106 that logs such data. Based upon this data, server 106 runs software that interprets said data (as described in more detail below). Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy (or vice versa); or (b) transmit a message to mobile device 105 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. Such signaling activity may be conducted via email, text message, pop-up alerts, voice messaging, or other means.

[0102] **Figures 6a** and **6b** illustrate a website that may be provided to assist users and others to interact with an embodiment of the subject invention. The website will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as choosing temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and to set macros that will allow changing the settings of the temperature for all periods with a single gesture such as a mouse click.

[0103] As shown in **Figure 6a**, screen 351 of website 350 displays current temperature 352 as sensed by thermostat 108. Clicking on "up" arrow 354 raises the setpoint 358; clicking the down arrow 356 lowers setpoint 358.

Screen 351 may also convey information about the outside weather conditions, such as a graphic representation 360 of the sun, clouds, etc. In conditioned spaces with multiple thermostats, screen 351 may allow users to select from multiple devices to adjust or monitor. Users will be able to use screen 351 by selecting, for example, master bedroom thermostat 362, living room thermostat 364, game room thermostat 366, or basement thermostat 368.

[0104] As shown in **Figure 6b**, screen 370 allows users to establish programming schedules. Row 372 shows a 24-hour period. Programming row 374 displays various programming periods and when they are scheduled, such as away setting 376, which begins at approximately 8AM and runs until approximately 5:30PM. When the away setting 376 is highlighted, the user can adjust the starting time and ending time for the setting by dragging the beginning time 378 to the left to choose an earlier start time, and dragging it to the right to make it later. Similarly, the user can drag ending time 380 to the left to make it earlier, and to the right to make it later. While away setting 376 is highlighted, the user can also change heating setpoint 382 by clicking on up arrow 384 or down arrow 386, and cooling setpoint 388 by clicking on up arrow 390 or down arrow 392. The user can save the program by clicking on save button 394.

[0105] **Figure 7a** illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the chiller and other common portions of the HVAC system to be allocated to a given conditioned space using the cycle time of the blower for the air handler in that conditioned space.

[0106] In step 402 the server retrieves from database 300 the cycling data for a given air handler for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was "on," or that it was "off". In step 404 the server retrieves from database 300 the cost per minute of run time for the air handler. This number is likely to be a function of several variables, which may include the cost per kilowatt hour of electricity (or the cost of other energy sources), the operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller. For example, a given chiller may be connected to 75 air handlers, and cost \$50 per

hour to operate when electricity costs \$0.09/kWh. In step 406 the server computes the cost to operate the individual air handler for the specified time interval. For example, if during a given minute the cost to operate a given chiller is \$1.50, and during that minute 20 air handlers are operating, then the chiller cost for each air handler would be \$0.075 for that minute. In step 408 the server determines whether there are additional time intervals for which operating cost is to be calculated. If there are additional intervals, the server returns to step 402. If not, in step 410 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0107] Figure 7b illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space using the cycle time of the blower for the air handler in that conditioned space plus variable speed data for that blower.

[0108] In step 502 the server retrieves from database 300 the cycling data for a given air handler for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was "on," or that it was "off". In step 504 the server retrieves from database 300 values for the speed of the fan in the air handler for the specified time interval. Such data may be expressed as a percentage of maximum speed, as a direct measurement of revolutions per minute, as a measurement of the current drawn by the electric motor powering the fan, or some other measurement. In step 506 the server retrieves from database 300 the cost per minute of run time for the air handler given the actual fan speed as retrieved in step 504. This number is also likely to be a function of variables including the cost per kilowatt/hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller. In step 508 the server computes the cost to operate the individual air handler for the specified time interval. In step 510 the server determines whether there are additional time intervals for which operating cost is to be calculated. If there are additional intervals, the server returns to step 502. If not, in step 512 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0109] Figure 7c illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space using the cycle time of the blower for the air handler in that conditioned space plus data from other blowers in other units. This approach permits calculation of variable operating costs – that is, it permits the amount allocated to a given unit to vary as actual operating cost change with the demands placed on the system by other units.

[0110] In step 602 the server retrieves from database 300 the cycling data for the first air handler to be evaluated for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was “on,” or that it was “off”. In step 604 the server retrieves from database 300 the cycling data for the next air handler to be evaluated for the specified time interval. The server continues to retrieve cycling data for additional air handlers until in step 606 the server retrieves from database 300 the cycling data for the last air handler to be evaluated.

[0111] In step 608 the server retrieves additional data to be used to allocate overall operating costs during the specified interval. Such data may include static data such as the square footage of each separate unit in the building, the relative location of each unit (because units with more south and west-facing windows are likely to have higher cooling loads, etc.), the size of each air handler and/or its included blower motor, or dynamic data such as the actual and/or predicted temperature rise (in the case of cooling) or drop (in the case of heating) for each air handler. In step 610 the server retrieves from database 300 the cost per minute of run time for the complete chiller system for the time increment being evaluated. This number may be calculated or actually measured, and will likely be a function of the cost of a kilowatt-hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller.

[0112] In step 612 the server calculates the cost of operating the first air handler for the time increment being evaluated. This cost will likely be a function of the overall cost per minute calculated in step 610, as well as the other parameters retrieved in steps 602-608. Specifically, the method described in

Figure 7c is intended to vary the allocated cost for a given unit during a given interval based upon the load placed upon the chiller not just by that unit, but by other units as well. This approach would allow equitable full allocation of chiller operating costs regardless of the number of units operating at a given time. Alternatively, the sources for the data used for this calculation may be sensor data sourced from the controlled system rather than stored values retrieved from a database.

[0113] In step 614 the server repeats the process followed in step 612 for the same time increment for the next air handler to be evaluated.

[0114] The server continues to calculate operating costs for additional time increments until in step 616 the server calculates operating costs for the last air handler to be evaluated for that time increment.

[0115] In step 618 the server determines whether additional time segments will require evaluation. If more time segments do require calculation, the server returns to step 602. If not, the server proceeds to step 620, in which it calculates the total allocated operating cost allocated to the first air handler for the relevant intervals.

[0116] The process disclosed in Figure 7c may be repeated for each of the air handlers connected to a given chiller.

[0117] **Figure 7d** illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space using the cycle time and fan speed of the blower for the air handler in that conditioned space plus data from other blowers in other units.

[0118] In step 702 the server retrieves from database 300 the cycling data for the first air handler to be evaluated for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was "on," or that it was "off". In step 704 the server retrieves from database 300 values for the speed of the fan in the air handler for the specified time interval. Such data may be expressed as a percentage of maximum speed, as a direct measurement of revolutions per minute, as a measurement of the current drawn by the electric motor powering the fan, or some other measurement.

[0119] In step 706 the server retrieves from database 300 the cycling data for the next air handler to be evaluated for the specified time interval, and in step 708 the server retrieves from database 300 values for the speed of the fan in the next air handler for the specified time interval. The server continues to retrieve cycling data and fan speed values for additional air handlers until in steps 710 and 712 the server retrieves from database 300 the cycling and fan speed data for the last air handler to be evaluated.

[0120] In step 714 the server retrieves additional data that may be used to allocate overall operating costs during the specified interval. Such data may include static data such as the square footage of each separate unit in the building, the relative location of each unit (because units with more south and west-facing windows are likely to have higher loads, etc.), the size of each air handler and/or its included blower motor, or dynamic data such as the actual or predicted temperature rise (in the case of cooling) or drop (in the case of heating) for each air handler.

[0121] In step 716 the server retrieves from database 300 the cost per minute of run time for the complete chiller system for the time increment being evaluated. This number may be calculated or actually measured, and will likely be a function of the cost of a kilowatt-hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller. Alternatively, the sources for the data used for this calculation may be sensor data sourced from the controlled system rather than stored values retrieved from a database.

[0122] In step 718 the server calculates the cost of operating the first air handler for the time increment being evaluated. This cost will likely be a function of the overall cost per minute calculated in step 716, as well as the other parameters retrieved in steps 702-714. Specifically, the method described in Figure 7d is intended to vary the allocated cost for a given unit during a given interval based upon the load placed upon the chiller not just by that unit, but by other units as well. This approach would allow equitable full allocation of chiller operating costs regardless of the number of units operating at a given time, even where the individual units employ variable-speed fans.

[0123] In step 720 the server calculates the cost of operating the next air handler for the time increment being evaluated. The server continues to calculate operating costs for additional air handlers until in step 722 the server calculates operating costs for the last air handler to be evaluated for that time increment.

[0124] In step 724 the server determines whether there are additional time intervals for which operating costs are to be calculated. If there are additional intervals, the server returns to step 702. If not, in step 726 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0125] **Figure 7e** illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space where the thermostat for a given unit operates by opening and closing a valve that determines whether the coolant in secondary loop 202 circulates through air handler in that conditioned space 110 plus data from other valves connected to the air handlers in other units.

[0126] In step 802 the server retrieves from database 300 the cycling data for a given air handler for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the valve that determines whether secondary coolant is circulated through the air handler was "on," or "off". In step 804 the server retrieves from database 300 values for the speed of the fan in the air handler for the specified time interval. Such data may be expressed as a percentage of maximum speed, as a direct measurement of revolutions per minute, as a measurement of the current drawn by the electric motor powering the fan, or some other measurement. In step 806 the server retrieves from database 300 the cost per minute of run time for the air handler given both the valve status and actual fan speed as retrieved in step 804. This number is also likely to be a function of the cost per kilowatt/hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller. In step 808 the server computes the cost to operate the individual air handler for the specified time interval. In step 810 the server determines whether there are additional time intervals for which operating cost is to be calculated. If there are additional intervals, the server returns to step 802. If not,

in step 812 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0127] **Figure 7f** illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space where server 106 has access to information regarding the overall change in temperature for the coolant in secondary loop 202.

[0128] This information may come from sensors 220a and 220b. This information can be useful because the energy required to operate the chiller may be expected to vary based upon the load placed on it by all of the connected air handlers. A large temperature rise from inlet to outlet may be expected to require the chiller to use more energy in order to reject the heat the air handlers add to the coolant; a minor temperature rise in coolant temperature will require less energy to dissipate. It may therefore be advantageous to allow the overall operating costs being allocated to individual air handlers to vary based upon overall operating costs as approximated by the temperature rise in the secondary coolant.

[0129] In step 902 the server retrieves information about absolute and/or relative coolant temperatures as it enters and leaves the air handlers being evaluated.

[0130] In step 904 the server retrieves from database 300 the cycling data for the first air handler to be evaluated for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was "on," or that it was "off". In step 906 the server retrieves from database 300 values for the speed of the fan in the air handler for the specified time interval. Such data may be expressed as a percentage of maximum speed, as a direct measurement of revolutions per minute, as a measurement of the current drawn by the electric motor powering the fan, or some other measurement.

[0131] In step 908 the server retrieves from database 300 the cycling data for the next air handler to be evaluated for the specified time interval, and in step 910 the server retrieves from database 300 values for the speed of the fan in the next air handler for the specified time interval. The server continues to

retrieve cycling data and fan speed values for additional air handlers until in steps 912 and 914 the server retrieves from database 300 the cycling and fan speed data for the last air handler to be evaluated.

[0132] In step 916 the server retrieves additional data that may be used to allocate overall operating costs during the specified interval. Such data may include static data such as the square footage of each separate unit in the building, the relative location of each unit (because units with more south and west-facing windows are likely to have higher loads, etc.), the size of each air handler and/or its included blower motor, or dynamic data such as the actual and/or predicted temperature rise (in the case of cooling) or drop (in the case of heating) for each air handler.

[0133] In step 918 the server retrieves from database 300 the cost per minute of run time for the complete chiller system for the time increment being evaluated. This number may be calculated or actually measured, and will likely be a function of the cost of a kilowatt-hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller.

[0134] In step 920 the server calculates the cost of operating the first air handler for the time increment being evaluated. This cost will likely be a function of the overall cost per minute calculated in step 922, as well as the other parameters retrieved in steps 902-916. Specifically, the method described in Figure 7f is intended to vary the allocated cost for a given unit during a given interval based upon the load placed upon the chiller not just by that unit, but by other units as well. This approach would allow equitable full allocation of chiller operating costs regardless of the number of units operating at a given time, even where the individual units employ variable-speed fans.

[0135] In step 922 the server calculates the cost of operating the next air handler for the time increment being evaluated. The server continues to calculate operating costs for additional air handlers until in step 924 the server calculates operating costs for the last air handler to be evaluated for that time increment.

[0136] In step 926 the server determines whether there are additional time intervals for which operating costs are to be calculated. If there are additional intervals, the server returns to step 902. If not, in step 928 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0137] **Figure 7g** illustrates how an embodiment of the subject invention can be used to calculate the cost of operation of the HVAC system to be allocated to a given conditioned space where server 106 has access to information regarding the speed of the fan or fans used to chill the primary loop 204 of chiller 206.

[0138] This information may come from sensors attached to the motor or motors, or from control circuitry that determines the voltage and/or current supplied to the motor, or even from external power sources used to drive especially large systems. This information can be useful because the energy required to operate the chiller may be expected to vary based upon the load placed on it by all of the connected air handlers. When loads are greater, the fan(s) will have to work harder in order to reject the heat the air handlers add to the secondary loop, which are in turn transferred to the primary loop; a minor temperature rise in secondary loop coolant temperature will require less energy to dissipate, thus permitting the fan(s) to run more slowly. It may therefore be advantageous to allow the overall operating costs being allocated to individual air handlers to vary based upon overall operating costs as approximated by the speed of the fans used to chill the primary loop coolant.

[0139] In step 1002 the server retrieves information about the energy consumption associated with operation of the main chiller fans 212. Such information may include rotational speed, current draw, diesel fuel flow rate (in the case of diesel-fueled engines turning the fans), or other means of measuring or estimating energy use.

[0140] In step 1004 the server retrieves from database 300 the cycling data for the first air handler to be evaluated for a specified time interval (such as for one minute). Such data could indicate that for the interval in question the fan in the air handler was "on," or that it was "off". In step 1006 the server retrieves from database 300 values for the speed of the fan in the air handler for the specified time interval. Such data may be expressed as a percentage of

maximum speed, as a direct measurement of revolutions per minute, as a measurement of the current drawn by the electric motor powering the fan, or some other measurement.

[0141] In step 1008 the server retrieves from database 300 the cycling data for the next air handler to be evaluated for the specified time interval, and in step 1010 the server retrieves from database 300 values for the speed of the fan in the next air handler for the specified time interval. The server continues to retrieve cycling data and fan speed values for additional air handlers until in steps 1012 and 1014 the server retrieves from database 300 the cycling and fan speed data for the last air handler to be evaluated.

[0142] In step 1016 the server retrieves additional data that may be used to allocate overall operating costs during the specified interval. Such data may include static data such as the square footage of each separate unit in the building, the relative location of each unit (because units with more south and west-facing windows are likely to have higher loads, etc.), the size of each air handler and/or its included blower motor, or dynamic data such as the actual or predicted temperature rise (in the case of cooling) or drop (in the case of heating) for each air handler.

[0143] In step 1018 the server retrieves from database 300 the cost per minute of run time for the complete chiller system for the time increment being evaluated. This number may be calculated or actually measured, and will likely be a function of the cost of a kilowatt-hour of electricity, the overall operating cost per time interval for the chiller unit associated with the air handler, and the number (and perhaps size) of other air handlers also associated with the same chiller.

[0144] In step 1020 the server calculates the cost of operating the first air handler for the time increment being evaluated. This cost will likely be a function of the overall cost per minute calculated in step 1022, as well as the other parameters retrieved in steps 1002-1016. Specifically, the method described in Figure 7g is intended to vary the allocated cost for a given unit during a given interval based upon the load placed upon the chiller not just by that unit, but by other units as well. This approach would allow equitable full

allocation of chiller operating costs regardless of the number of units operating at a given time, even where the individual units employ variable-speed fans.

[0145] In step 1022 the server calculates the cost of operating the next air handler for the time increment being evaluated. The server continues to calculate operating costs for additional air handlers until in step 1024 the server calculates operating costs for the last air handler to be evaluated for that time increment.

[0146] In step 1026 the server determines whether there are additional time intervals for which operating costs are to be calculated. If there are additional intervals, the server returns to step 1002. If not, in step 1028 the server calculates the allocated HVAC cost for all of the individual time intervals.

[0147] It should be noted that the processes described above in the context of air conditioning and the circulation of a coolant can be applied in other contexts as well, such as a hydronic system in which a heated fluid is circulated, steam-based systems, etc.

[0148] Other central-plant HVAC system topologies are also possible. So long as it is possible to measure at least one dynamic aspect of the cost of operating the common aspects of the system, and at least one dynamic aspect of the system that is controlled separately for individual occupancy units, it will be possible to allocate operating costs to some degree based upon such measurements.

[0149] In addition to being used to help properly allocate the cost of operating a centralized chiller-based HVAC system, the subject invention may also be used to help enable and encourage owners, tenants and other occupants of units conditioned by such systems to be more energy efficient.

[0150] One of the most significant ways to cut HVAC energy use without adversely affecting comfort is to avoid heating and cooling spaces when they are unoccupied. Directly sensing occupancy with motion sensors is common in the hospitality industry, but is more problematic in multi-room contexts. It also requires expensive retrofitting in existing structures.

[0151] Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not

easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

[0152] Although progress in residential HVAC control has been slow, tremendous technological change has come to the tools used for personal communication. When programmable thermostats were first offered, telephones were virtually all tethered by wires to a wall jack. But now a large percentage of the population carries at least one mobile device capable of sending and receiving voice or data or even video (or a combination thereof) from almost anywhere by means of a wireless network. These devices create the possibility that a consumer can, with an appropriate mobile device and a network-enabled HVAC system, control his or her HVAC system even when away from home. But systems that relay on active management decisions by consumers are likely to yield sub-optimal energy management outcomes, because consumers are unlikely to devote the attention and effort required to fully optimize energy use on a daily basis.

[0153] Many new mobile devices now incorporate another significant new technology – the ability to geolocate the device (and thus, presumably, the user of the device). One method of locating such devices uses the Global Positioning System (GPS). The GPS system uses a constellation of orbiting satellites with very precise clocks to triangulate the position of a device anywhere on earth based upon arrival times of signals received from those satellites by the

device. Another approach to geolocation triangulates using signals from multiple cell phone towers. Such systems can enable a variety of so-called "location based services" to users of enabled devices. These services are generally thought of as aids to commerce like pointing users to restaurants or gas stations, etc.

[0154] The subject invention can actually indirectly detect and even anticipate some occupancy changes without a direct occupancy sensor by using information about the behavior and location of users of that space as gathered from other electronic devices used by those actual or potential occupants.

[0155] **Figure 8** is a high-level flowchart showing the steps involved in the operation of one embodiment of the subject invention in order to use a mobile device to assist in the process of determining whether to condition a given space for occupancy. In step 1302, mobile device 105 transmits geopositioning information to server 106 via the Internet. In step 1304 the server compares the latest geopositioning data point to previous data points in order to determine whether a change in location or vector of movement has occurred. In step 1306 the server evaluates the geopositioning data in order to determine whether the temperature settings for the HVAC system for the structure associated with the mobile device 105 should be optimized for an unoccupied structure, or for an occupied structure in light of the movement (or lack thereof) in the geopositioning data. If the server 106 determines that the home should be in occupied or "home" mode, then in step 1308 the server queries database 300 to determine whether thermostat 108 is already set for home or away mode. If thermostat 108 is already in home mode, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1310 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the space when occupied. If the user has previously specified that the application should not make such changes without further user input,

then in step 1312 the application transmits a command to the location specified by the user (generally mobile device 105) directing the device display a message informing the user that the current setting assumes an unoccupied space and asking the user to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1318 the application will write to database 300 the fact that the user has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1318 the application writes the updated setting information to database 300.

[0156] If the server 106 determines in step 1306 that the home should be in unoccupied or away mode, then in step 1350 the server queries database 300 to determine whether thermostat 108 is set for set for home or away mode. If thermostat 108 is already in home mode, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is occupied, then in step 1352 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 1358, in which it changes the programmed setpoint for the thermostat to the setting intended for the space when unoccupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1354 the application transmits a command to the location specified by the user (generally mobile device 105) directing the device display a message informing the user that the current setting assumes an unoccupied space and asking the user to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1318 the application will write to database 300 the fact that the user has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1318 the application writes the updated setting information to database 300. If thermostat 108 is already in away mode, the

program ends. If it was in home mode, then in step 1314 server 108 initiates a state change to put thermostat 108 in away mode. In either case, the server then in step 1316 writes the state change to database 300. In each case the server can also send a message to the person who owns the mobile device requesting, confirming or announcing the state change.

[0157] **Figure 9** is a flowchart that shows one process by which the subject invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the mobile device attached to the system. The process shown assumes (a) a static hierarchy of temperature preferences as between multiple occupants (that is, that for a given conditioned space, mobile user #1's preferences will always control the outcome if mobile user #1 is present, that mobile user #2's preferences yield to #1's, but always prevail over user #3, etc.); and (b) that there are no occupants to consider who are not associated with a geopositioning-enabled mobile device. Other heuristics may be applied in order to account for more dynamic interactions of preferences, for situations in which some occupants do not have enabled mobile devices, etc.

[0158] In step 1402 server 106 retrieves the most recent geospatial coordinates from the mobile device 105 associated with mobile user #1. In step 1404 server 106 uses current and recent coordinates to determine whether mobile user #1's "home" (or "occupied") settings should be applied. If server 106 determines that User #1's home settings should be applied, then in step 1406 server 106 applies the correct setting and transmits it to the thermostat(s). In step 1408, server 106 writes to database 300 the geospatial information used to adjust the programming. If after performing step 1404, the server concludes that mobile user #1's "home" settings should not be applied, then in step 1412 server 106 retrieves the most recent geospatial coordinates from the mobile device 105 associated with mobile user #2. In step 1414 server 106 uses current and recent coordinates to determine whether mobile user #2's "home" settings should be applied. If server 106 determines that User #2's home settings should be applied, then in step 1416 server 106 applies the correct setting and transmits it to the thermostat(s). In step 1408, server 106 writes to database 300 the geospatial and other relevant information used to adjust the programming. If after performing

step 1414, the server concludes that mobile user #2's "home" settings should not be applied, then in step 1422 server 106 retrieves the most recent geospatial coordinates from the mobile device 105 associated with mobile user #N. In step 1424 server 106 uses current and recent coordinates to determine whether mobile user #N's "home" settings should be applied. If server 106 determines that User #N's home settings should be applied, then in step 1426 server 106 applies the correct setting and transmits it to the thermostat(s). In step 1408, server 106 writes to database 300 the geospatial information used to adjust the programming.

[0159] If none of the mobile devices associated with a given home or other structure report geospatial coordinates consistent with occupancy, then in step 1430 the server instructs the thermostat(s) to switch to or maintain the "away" setting.

[0160] Additional energy-saving and comfort-enhancing functionality is also envisioned as part of the subject invention. For example, information from historic data may be used to predict how long it will take a regular user to reach a conditioned space from the current coordinates, and the estimated arrival time may be used to calculate optimal cycling strategies for the HVAC system. Thus the longer it is predicted to take the mobile device user to arrive at home, the later the subject invention will switch to an occupied setting. In addition, information about traffic conditions may be integrated into these calculations, so that the geospatial data relative to mobile device 105 may indicate that a user is taking his or her normal route, but because of a traffic jam, is likely to arrive later than would otherwise be expected. The characteristics of a given location may be used to infer arrival times as well. For example, if the geospatial data indicates that the user of mobile device 105 has arrived at the supermarket on his way to the conditioned space, a delay of 20 minutes is likely, whereas if the user has parked at a restaurant, the delay is likely to be one hour.

[0161] It is also possible to incorporate more sophisticated heuristics in incorporating the varying preferences of multiple occupants of a given structure. For example, rules can be structured so that User #1's preferences control during the heating season, but not during the cooling season; User #2's preferences might control during certain times of the day but not others; User #3's

preferences may take precedence whenever they result in a more energy efficient strategy, but not when they result in increased energy use, and so on.

[0162] The subject invention is capable of delivering additional techniques that increase comfort and efficiency. In addition to using the system to allow better signaling and control of the HVAC system, which relies primarily on communication running from the server to the thermostat, the bi-directional communication will also allow thermostat 108 to regularly measure and send to the server information about the temperature in the conditioned space. By comparing outside temperature, inside temperature, thermostat settings, cycling behavior of the HVAC system, and other variables, the system will be capable of numerous diagnostic and controlling functions beyond those of a standard thermostat. It will also be capable of using the known physical relationship between different conditioned spaces (that is, the fact that, for example, one apartment might be directly above another) to understand and optimize the use of energy in those spaces. Thus if the occupants of an apartment on the 10th floor maintain very high winter setpoints, thereby reducing the need to run the heating for the unit directly above it on the 11th floor (because heat rises), the cost allocation system could, if desired, share some of the cost of that heating between units, or could advise the occupant of the 10th floor unit of these facts, or otherwise use the data to reinforce more energy-efficient choices.

[0163] For example, **Fig. 10a** shows a graph of inside temperature, outside temperature and HVAC activity for a 24-hour period in a specific hypothetical conditioned space. When outside temperature 1502 increases, inside temperature 1504 follows, but with some delay because of the thermal mass of the building, unless the air conditioning 1506 operates to counteract this effect. When the air conditioning turns on, the inside temperature stays constant (or rises at a much lower rate or even falls) despite the rising outside temperature. In this example, frequent and heavy use of the air conditioning results in only a very slight temperature increase inside the space of 4 degrees, from 72 to 76 degrees, despite the increase in outside temperature from 80 to 100 degrees.

[0164] **Figure 10b** shows a graph of the same conditioned space on the same day, but assumes that the air conditioning is turned off from noon to

7PM. As expected, the inside temperature 1504a rises with increasing outside temperatures 1502 for most of that period, reaching 88 degrees at 7PM. Because server 106 logs the temperature readings from inside each conditioned space (whether once per minute or over some other interval), as well as the timing and duration of air conditioning cycles, database 300 will contain a history of the thermal performance of each such space. That performance data will allow the server 106 to calculate an effective thermal mass for each such space – that is, the speed with which the temperature inside a given conditioned space will change in response to changes in outside temperature. Because the server will also log these inputs against other inputs including time of day, humidity, etc. the server will be able to predict, at any given time on any given day, the rate at which inside temperature should change for given inside and outside temperatures. Because the server also logs similar data from other thermostats in other units in the same building, it is also possible to predict how temperatures and setpoints in one unit will affect temperatures and system run times on adjacent units.

[0165] The ability to predict the rate of change in inside temperature in a given space under varying conditions may be applied by in effect holding the desired future inside temperature as a constraint and using the ability to predict the rate of change to determine when the HVAC system must be turned on in order to reach the desired temperature at the desired time. The ability of an HVAC system to vary turn-on time in order to achieve a setpoint with minimum energy use may be thought of as Just In Time (JIT) optimization.

[0166] Figure 11 shows a flowchart illustrating the high-level process for controlling a just-in-time (JIT) event for a specific occupied space. In step 1512, the server determines whether a specific thermostat 108 is scheduled to run the preconditioning program. If, not, the program terminates. If it so scheduled, then in step 1514 the server retrieves the predetermined target time when the preconditioning is intended to have been completed (TT). Using TT as an input, in step 1516 the server then determines the time at which the computational steps required to program the preconditioning event will be performed (ST). In step 1518, performed at start time ST, the server begins the process of actually calculating the required parameters, as discussed in greater

detail below. Then in 1520 specific setpoint changes are transmitted to the thermostat so that the temperature inside the home may be appropriately changed as intended.

[0167] Figure 12 shows a more detailed flowchart of the process. In step 1532, the server retrieves input parameters used to create a JIT event for a specific occupied space. These parameters include the maximum time allowed for a JIT event for thermostat 108 (MTI), the target time the system is intended to hit the desired temperature (TT), and the desired inside temperature at TT (TempTT). It is useful to set a value for MTI because, for example, it will be reasonable to prevent the HVAC system from running a preconditioning event if it would be expected to take 8 hours, which might be prohibitively expensive.

[0168] In step 1534, the server retrieves data used to calculate the appropriate start time with the given input parameters. This data may include a set of algorithmic learning data (ALD), composed of historic readings from the thermostat, together with associated weather data, such as outside temperature, solar radiation, humidity, wind speed and direction, etc.; together with weather forecast data for the subject location for the period when the algorithm is scheduled to run (the weather forecast data, or WFD). The forecasting data can be as simple as a listing of expected temperatures for a period of hours subsequent to the time at which the calculations are performed, or may include more detailed tables including humidity, solar radiation, wind, etc. Alternatively, it can include additional information such as some or all of the kinds of data collected in the ALD.

[0169] In step 1536, the server uses the ALD and the WFD to create prediction tables that determine the expected rate of change or slope of inside temperature for each minute of HVAC cycle time (ΔT) for the relevant range of possible pre-existing inside temperatures and outside climatic conditions. An example of a simple prediction table is illustrated in Figs. 17-1 and 17-2.

[0170] In step 1538, the server uses the prediction tables created in step 1106, combined with input parameters TT and Temp(TT) to determine the time at which slope ΔT intersects with predicted initial temperature PT. The time between PT and TT is the key calculated parameter: the preconditioning time interval, or PTI.

[0171] In step 1540, the server checks to confirm that the time required to execute the pre-conditioning event PTI does not exceed the maximum parameter MTI. If PTI exceeds MTI, the scheduling routine concludes and no ramping setpoints are transmitted to the thermostat.

[0172] If the system is perfect in its predictive abilities and its assumptions about the temperature inside the home are completely accurate, then in theory the thermostat can simply be reprogrammed once – at time PT, the thermostat can simply be reprogrammed to Temp(TT). However, there are drawbacks to this approach. First, if the server has been overly conservative in its predictions as to the possible rate of change in temperature caused by the HVAC system, the inside temperature will reach TT too soon, thus wasting energy and at least partially defeating the purpose of running the preconditioning routine in the first place. If the server is too optimistic in its projections, there will be no way to catch up, and the home will not reach Temp(TT) until after TT. Thus it would be desirable to build into the system a means for self-correcting for slightly conservative start times without excessive energy use. Second, the use of setpoints as a proxy for actual inside temperatures in the calculations is efficient, but can be inaccurate under certain circumstances. In the winter (heating) context, for example, if the actual inside temperature is a few degrees above the setpoint (which can happen when outside temperatures are warm enough that the home's natural "set point" is above the thermostat setting), then setting the thermostat to Temp(TT) at time PT will almost certainly lead to reaching TT too soon as well.

[0173] The currently preferred solution to both of these possible inaccuracies is to calculate and program a series of intermediate settings between Temp(PT) and Temp(TT) that are roughly related to ΔT .

[0174] Thus if MTI is greater than PTI, then in step 1542 the server calculates the schedule of intermediate setpoints and time intervals to be transmitted to the thermostat. Because thermostats cannot generally be programmed with steps of less than 1 degree F, ΔT is quantized into discrete interval data of at least 1 degree F each. For example, if Temp(PT) is 65 degrees F, Temp(TT) is 72 degrees F, and PT is 90 minutes, the thermostat might be programmed to be set at 66 for 10 minutes, 67 for 12 minutes, 68 for 15

minutes, etc. The server may optionally limit the process by assigning a minimum programming interval (e.g., at least ten minutes between setpoint changes) to avoid frequent switching of the HVAC system, which can reduce accuracy because of the thermostat's compressor delay circuit, which may prevent quick corrections. The duration of each individual step may be a simple arithmetic function of the time PTI divided by the number of whole-degree steps to be taken; alternatively, the duration of each step may take into account second order thermodynamic effects relating to the increasing difficulty of "pushing" the temperature inside a conditioned space further from its natural setpoint given outside weather conditions, etc. (that is, the fact that on a cold winter day it may take more energy to move the temperature inside the home from 70 degrees F to 71 than it does to move it from 60 degrees to 61).

[0175] In step 1544, the server schedules setpoint changes calculated in step 1112 for execution by the thermostat.

[0176] With this system, if actual inside temperature at PT is significantly higher than Temp(PT), then the first changes to setpoints will have no effect (that is, the HVAC system will remain off), and the HVAC system will not begin using energy, until the appropriate time, as shown in Figure 12. Similarly, if the server has used conservative predictions to generate ΔT , and the HVAC system runs ahead of the predicted rate of change, the incremental changes in setpoint will delay further increases until the appropriate time in order to again minimize unnecessary energy use.

[0177] Figures 13(a) through 13(d) shows the steps in the preconditioning process as a graph of temperature and time. Figure 13(a) shows step 1532, in which inputs target time TT 1552, target temperature Temp(TT) 1554, maximum conditioning interval MTI 1556 and the predicted inside temperature during the period of time the preconditioning event is likely to begin Temp(PT) 1558 are retrieved.

[0178] Figure 13(b) shows the initial calculations performed in step 1538, in which expected rate of change in temperature ΔT 1560 inside the home is generated from the ALD and WFD using Temp(TT) 1554 at time TT 1552 as the endpoint.

[0179] Figure 13(c) shows how in step 1538 ΔT 1560 is used to determine start time PT 1562 and preconditioning time interval PTI 1564. It also shows how in step 1540 the server can compare PTI with MTI to determine whether or not to instantiate the pre-conditioning program for the thermostat.

[0180] Figure 13(d) shows step 1542, in which specific ramped setpoints 1566 are generated. Because of the assumed thermal mass of the system, actual inside temperature at any given time will not correspond to setpoints until some interval after each setpoint change. Thus initial ramped setpoint 1216 may be higher than Temp(PT) 1558, for example.

[0181] Figure 14 shows an example of the types of data that may be used by the server in order to calculate ΔT 1560. Such data may include inside temperature 1572, outside temperature 1574, cloud cover 1576, humidity 1578, barometric pressure 1580, wind speed 1582, and wind direction 1584.

[0182] Each of these data points should be captured at frequent intervals. In the currently preferred embodiment, as shown in Figure 14, the interval is once every 60 seconds.

[0183] Figure 15 shows application of the subject invention in a conditioned space. Temperature and setpoints are plotted for the 4-hour period from 4AM to 8AM with temperature on the vertical axis and time on the horizontal axis. The winter nighttime setpoint 1592 is 60 degrees F; the morning setpoint temperature 1594 is 69 degrees F. The outside temperature 1596 is approximately 45 degrees F. The target time TT 1598 for the setpoint change to morning setting is 6:45AM. In the absence of the subject invention, the occupant could program the thermostat to change to the new setpoint at 6:45, but there is an inherent delay between a setpoint change and the response of the temperature inside the home. (In this space on this day, the delay is approximately fifty minutes.) Thus if the occupant truly desired to achieve the target temperature at the target time, some anticipation would be necessary. The amount of anticipation required depends upon numerous variables, including the capacity and state of tune of the HVAC system, the thermal properties of the building envelope, current and recent weather conditions, etc.

[0184] After calculating the appropriate slope ΔT 1560 by which to ramp inside temperature in order to reach the target as explained above, the server

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transmits a series of setpoints 1555 to the thermostat because the thermostat is presumed to only accept discrete integers as program settings. (If a thermostat is capable of accepting finer settings, as in the case of some thermostats designed to operate in regions in which temperature is generally denoted in Centigrade rather than Fahrenheit, which accept settings in half-degree increments, tighter control may be possible.) In any event, in the currently preferred embodiment of the subject invention, programming changes are quantized such that the frequency of setpoint changes is balanced between the goal of minimizing network traffic and the frequency of changes made on the one hand and the desire for accuracy on the other. Balancing these considerations may result in some cases in either more frequent changes or in larger steps between settings. As shown in Fig. 15, the setpoint "stairsteps" from 60 degrees F to 69 degrees F in nine separate setpoint changes over a period of 90 minutes.

[0185] Because the inside temperature 1559 when the setpoint management routine was instantiated at 5:04 AM was above the "slope" and thus above the setpoint, the HVAC system was not triggered and no energy was used unnecessarily heating the space before such energy use was required. Actual energy usage does not begin until 5:49 AM.

[0186] Figure 16 shows application of the subject invention in a different conditioned space during a similar four-hour interval. In Figure 16, the predicted slope ΔT 1560 is less conservative relative to the actual performance of the home and HVAC system, so there is no off cycling during the preconditioning event — the HVAC system turns on at approximately 4:35 AM and stays on continuously during the event. The conditioned space reaches the target temperature Temp(TT) roughly two minutes prior to target time TT.

[0187] Figures 17-1 and 17-2 shows a simple prediction table. The first column 1602 lists a series of differentials between outside and inside temperatures. Thus when the outside temperature is 14 degrees and the inside temperature is 68 degrees, the differential is -54 degrees; when the outside temperature is 94 degrees and the inside temperature is 71 degrees, the differential is 13 degrees. The second column 1604 lists the predicted rate of change in inside temperature ΔT 1210 assuming that the furnace is running in terms of degrees Fahrenheit of change per hour. A similar prediction table will be

generated for predicted rates of change when the air conditioner is on; additional tables may be generated that predict how temperatures will change when the HVAC system is off.

[0188] Alternatively, the programming of the just-in-time setpoints may be based not on a single rate of change for the entire event, but on a more complex multivariate equation that takes into account the possibility that the rate of change may be different for events of different durations, as well as other variables such as wind speed, humidity, solar conditions (cloudy vs. clear), etc.

[0189] The method for calculating start times may also optionally take into account not only the predicted temperature at the calculated start time, but may incorporate measured inside temperature data from immediately prior to the scheduled start time in order to update calculations, or may employ more predictive means to extrapolate what the inside temperature is likely to be based upon outside temperatures, etc.

[0190] Significant energy savings are possible if HVAC control systems can reliably detect when a space is unoccupied. Explicit occupancy sensors are widely available, and can generally accomplish this, though this task is much easier in single-room spaces like hotel rooms than it is in multi-room spaces like larger homes. But the subject invention can accomplish some of the benefits of explicit occupancy detection by recognizing manual interaction with the physical thermostat – the buttons on the thermostat itself can only be pressed if someone is there to press them.

[0191] Some thermostats are capable of explicitly reporting manual overrides, but others are not. Where, as with the subject invention, an energy management service may make frequent changes to thermostat setpoints, disambiguating human interactions is of great importance.

[0192] Because the instant invention is capable of recording the setpoint actually used at a connected thermostat over time, it is also capable of inferring manual setpoint changes (as, for example, entered by pushing the “up” or “down” arrow on the control panel of the device) even when such overrides of the pre-set program are not specifically recorded as such by the thermostat.

[0193] In order to adapt programming to take into account the manual overrides entered into the thermostat, it is first necessary to determine when a

manual override has in fact occurred. Most thermostats, including many two-way communicating devices, do not record such inputs locally, and neither recognize nor transmit the fact that a manual override has occurred. Furthermore, in a system as described herein, frequent changes in setpoints may be initiated by algorithms running on the server, thereby making it impossible to infer a manual override from the mere fact that the setpoint has changed. It is therefore necessary to deduce the occurrence of such events from the data that the subject invention does have access to.

[0194] Figure 18 illustrates the currently preferred method for detecting the occurrence of a manual override event. In step 1702, the server retrieves the primary data points used to infer the occurrence of a manual override from one or more databases in overall database structure 300. The data should include each of the following: for the most recent point at which it can obtain such data (time0) the actual setpoint as recorded at the thermostat at (A0); for the point immediately prior to time0 (time-1), the actual setpoint recorded for the thermostat (A-1); for time0 the setpoint as scheduled by server 106 according to the basic setpoint programming (S0), and for time-1 the setpoint as scheduled by server 106 according to the standard setpoint programming (S-1). In step 1704, the server retrieves any additional automated setpoint changes C that have been scheduled for the thermostat by server 106 at time0. Such changes may include algorithmic changes intended to reduce energy consumption, etc. In step 1706 the server calculates the difference (dA) between A0 and A-1; for example, if the actual setpoint is 67 degrees at T-1 and 69 at T0, dA is +2; if the setpoint at T-1 is 70 and the setpoint at T0 is 66, dA is -4. In step 1708, the server performs similar steps in order to calculate dS, the difference between S0 and S-1. This is necessary because, for example, the setpoint may have been changed because the server itself had just executed a change, such as a scheduled change from “away” (or unoccupied) to “home” (or occupied) mode. In step 1710 the server evaluates and sums all active algorithms and other server-initiated strategies to determine their net effect on setpoint at time0. For example, if one algorithm has increased setpoint at time0 by 2 degrees as a short-term energy savings measure, but another algorithm has decreased the setpoint by one degree to

compensate for expected subjective reactions to weather conditions, the net algorithmic effect sC is +1 degree.

[0195] In step 1712, the server calculates the value for M , where M is equal to the difference between actual setpoints dA , less the difference between scheduled setpoints dS , less the aggregate of algorithmic change sC . In step 1714 the server evaluates this difference. If the difference equals zero, the server concludes that no manual override has occurred, and the routine terminates. But if the difference is any value other than zero, then the server concludes that a manual override has occurred. Thus in step 1716 the server logs the occurrence and magnitude of the override to one or more databases in overall database structure 300.

[0196] The process of interpreting a manual override is shown in Figure 19. Step 1802 is the detection of an override, as described in detail in Figure 18. In step 1804 the server retrieves the stored rules for the subject thermostat 108. Such rules may include weather and time-related inferences such as "if outside temperature is greater than 85 degrees and inside temperature is more than 2 degrees above setpoint and manual override lowers setpoint by 3 or more degrees, then revert to original setpoint in 2 hours," or "if heating setpoint change is scheduled from 'away' to 'home' within 2 hours after detected override, and override increases setpoint by at least 2 degrees, then change to 'home' setting," or the like. In step 1806 the server retrieves contextual data required to interpret the manual override. Such data may include current and recent weather conditions, current and recent inside temperatures, etc. This data is helpful because it is likely that manual overrides are at least in part deterministic: that is, that they may often be explained by such contextual data, and such understanding can permit anticipation of the desire on the part of the occupants to override and to adjust programming accordingly, so as to obviate the need for such changes. The amount of data may be for a period of a few hours to as long as several days or more. Recent data may be more heavily weighted than older data in order to assure rapid adaptation to situations in which manual overrides represent stable changes such as changes in work schedules, etc.

[0197] In step 1808 the server retrieves any relevant override data from the period preceding the specific override being evaluated that has not yet been

evaluated by and incorporated into the long-term programming and rules engines as described below in Figure 19. In step 1810 the server evaluates the override and determines which rule, if any, should be applied as a result of the override. In step 1812 the server determines whether to alter the current setpoint as a result of applying the rules in step 1810. If no setpoint change is indicated, then the routine ends. If a setpoint change is indicated, then in step 1814 the server transmits the setpoint change to the thermostat for execution, and in step 1816 it records that change to one or more databases in overall database structure 300.

[0198] In order to ensure that both the stored rules for interpreting manual overrides and the programming itself continue to most accurately reflect the intentions of the occupants, the server will periodically review both the rules used to interpret overrides and the setpoint scheduling employed. Figure 20 shows the steps used to incorporate manual overrides into the long-term rules and setpoint schedule. In step 1902 the server retrieves the stored programming for a given thermostat as well as the rules for interpreting overrides for that thermostat. In step 1904 the server retrieves the recent override data as determined using the process described in Figures 18 and 19 to be evaluated for possible revisions to the rules and the programming. In step 1906 the server retrieves the contextual data regarding overrides retrieved in step 1904 (Because the process illustrated in Figure 20 is not presently expected to be executed as a real-time process, and is expected to be run anywhere from once per day to once per month, the range and volume of contextual data to be evaluated is likely to be greater than in the process illustrated in Figure 19).

[0199] In step 1908 the server interprets the overrides in light of the existing programming schedule, rules for overrides, contextual data, etc. In step 1910 the server determines whether, as a result of those overrides as interpreted, the rules for interpreting manual overrides should be revised. If the rules are not to be revised, the server moves to step 1914. If the rules are to be revised, then in step 1912 the server revises the rules and the new rules are stored in one or more databases in overall database structure 300. In step 1914 the server determines whether any changes to the baseline programming for the thermostat should be revised. If not, the routine terminates. If revisions are warranted, then in step 1916 the server retrieves from database 900 the permissions the server

has to make autonomous changes to settings. If the server has been given permission to make the proposed changes, then in step 1918 the server revises the thermostat's programming and writes the changes to one or more databases in overall database structure 300. If the server has not been authorized to make such changes autonomously, then in step 1920 the server transmits the recommendation to change settings to the customer in the manner previously specified by the customer, such as email, changes to the customer's home page as displayed on website 200, etc.

[0200] Additional means of implementing the instant invention may be achieved using variations in system architecture. For example, much or even all of the work being accomplished by remote server 106 may also be done by thermostat 108 if that device has sufficient processing capabilities, memory, etc. Alternatively, these steps may be undertaken by a local processor such as a local personal computer, or by a dedicated appliance having the requisite capabilities, such as gateway 112.

[0201] Demand for electricity varies widely from winter to summer, and from early morning to late afternoon. Air conditioning is a major component of peak load. The traditional approach to dealing with high demand on hot days is to build increase supply – build new power plants, or buy additional capacity on the spot market. But because many people now consider reducing loads to be a superior strategy for matching electricity supply to demand when the grid is stressed, the ability to shed load by turning off air conditioners during peak events has become a useful tool for managing loads. A key component of any such system is the ability to document and verify that a given air conditioner has actually turned off. Data logging hardware can accomplish this, but due to the cost is usually only deployed for statistical sampling. The instant invention provides a means to verify demand response without additional hardware such as a data logger.

[0202] Thermostats 108 record temperature readings at frequent intervals, such as once per minute. Because server 106 logs the temperature readings from inside each conditioned space (whether once per minute or over some other interval), as well as the timing and duration of air conditioning cycles, database 300 will contain a history of the thermal performance of each

conditioned space. That performance data will allow the server 106 to calculate an effective thermal mass for each such space – that is, the speed with the temperature inside a given space is expected to change in response to changes in outside temperature. Because the server will also log these inputs against other inputs including time of day, humidity, etc. the server will be able to predict, at any given time on any given day, the rate at which inside temperature should change for given inside and outside temperatures. This will permit remote verification of load shedding by the air conditioner without directly measuring or recording the electrical load drawn by the air conditioner, and without requiring reliance on bare HVAC cycling data, which is susceptible to manipulation.

[0203] Figure 21 shows the steps followed in order to initiate air conditioner shutoff. When a summer peak demand situation occurs, the utility will transmit an email or other signal 2202 to server 106 requesting a reduction in load. Server 106 will determine 2204 if a given conditioned space is served by the utility seeking reduction; determine 2206 if a given user has agreed to reduce peak demand; and determine 2208 if a reduction of consumption by the user is required or desirable in order to achieve the reduction in demand requested by the utility or demand response aggregator. The server will transmit 2210 a signal to the user's thermostat 108 signaling the thermostat to shut off the air conditioner 110.

[0204] Figure 22 shows the steps followed in order to verify that a specific air conditioner has in fact been shut off. Server 106 will receive and monitor 2302 the temperature readings sent by the user's thermostat 108. The server then calculates 2304 the temperature reading to be expected for that thermostat given inputs such as current and recent outside temperature, recent inside temperature readings, the calculated thermal mass of the structure, temperature readings in other conditioned spaces such as other units within the same building, etc. The server will compare 2306 the predicted reading with the actual reading. If the server determines that the temperature inside the conditioned space is rising at roughly the rate predicted if the air conditioning is shut off, then the server confirms 2308 that the air conditioning has been shut off. If the temperature reading from the thermostat shows no increase, or significantly less increase than predicted by the model, then the server concludes 2310 that

the air conditioning was not switched off, and that no contribution to the demand response request was made.

[0205] For example, assume that on at 3PM on date Y utility X wishes to trigger a demand reduction event. A server at utility X transmits a message to the server at demand reduction service provider Z requesting W megawatts of demand reduction. The demand reduction service provider server determines that it will turn off the air conditioner for conditioned space A in order to contribute to the required demand reduction. At the time the event is triggered, the inside temperature as reported by the thermostat in conditioned space A is 72 degrees F. The outside temperature near conditioned space A is 96 degrees Fahrenheit. The inside temperature at conditioned space B, which is not part of the demand reduction program, but is both connected to the demand reduction service server and located geographically proximate to conditioned space A, is 74F. Because the air conditioner in conditioned space A has been turned off, the temperature inside conditioned space A begins to rise, so that at 4PM it has increased to 79F. Because the server is aware of the outside temperature, which remains at 96F, and of the rate of temperature rise inside conditioned space A on previous days on which temperatures have been at or near 96F, and the temperature in conditioned space B, which has risen only to 75F because the air conditioning in conditioned space B continues to operate normally, the server is able to confirm with a high degree of certainty that the air conditioner in conditioned space A has indeed been shut off.

[0206] In contrast, if the HVAC system for conditioned space A has been tampered with, so that a demand reduction signal from the server does not actually result in shutting off the air conditioner for conditioned space A, when the server compares the rate of temperature change in conditioned space A against the other data points, the server will receive data inconsistent with the rate of increase predicted. As a result, it will conclude that the air conditioner has not been shut off in conditioned space A as expected, and may not credit conditioned space A with the financial credit that would be associated with demand reduction compliance, or may trigger a business process that could result in termination of conditioned space A's participation in the demand reduction program.

[0207] **Figure 23** illustrates the movement of signals and information between the components of one embodiment of the subject invention to trigger and verify a demand reduction response. Where demand response events are undertaken on behalf of a utility by a third party, participants in the communications may include electric utility server 2400, demand reduction service server 106, and thermostat 108. In step 2402 the electric utility server 2400 transmits a message to demand reduction service server 106 requesting a demand reduction of a specified duration and size. Demand reduction service server 106 uses database 300 to determine which subscribers should be included in the demand reduction event. For each included subscriber, the server then sends a signal 2404 to the subscriber's thermostat 108 instructing it (a) to shut down at the appropriate time or (b) to allow the temperature as measured by the thermostat to increase to a certain temperature at the specified time, depending upon the agreement between the owner (or tenant, or facilities manager as the case may be) and the demand reduction service provider. The server then receives 2406 temperature measurements from the subscriber's thermostat. At the conclusion of the demand reduction event, the server transmits a signal 2408 to the thermostat permitting the thermostat to signal its attached HVAC system to resume cooling, if the system has been shut off, or to reduce the target temperature to its non-demand reduction setting, if the target temperature was merely increased. If thermostat 108 is capable of storing scheduling information, these instructions may be transmitted prior to the time they are to be executed and stored locally. After determining the total number of subscribers actually participating in the DR event, the server then calculates the total demand reduction achieved and sends a message 2410 to the electric utility confirming such reduction.

[0208] Additional steps may be included in the process. For example, if the subscriber has previously requested that notice be provided when a peak demand reduction event occurs, the server may also send an alert, which may be in the form of an email or text message or an update to the personalized web page for that user, or both. If the server determines that a given conditioned space has (or has not) complied with the terms of its demand reduction

agreement, the server may send a message to the subscriber confirming that fact.

[0209] It should also be noted that in some climate zones, peak demand events occur during extreme cold weather rather than (or in addition to) during hot weather. The same process as discussed above could be employed to reduce demand by shutting off electric heaters and monitoring the rate at which temperatures fall.

[0210] It should also be noted that the peak demand reduction service can be performed directly by an electric utility, so that the functions of server 106 can be combined with the functions of server 2400.

[0211] It should also be noted that additional variations are possible in a situation in which a building has multiple separately occupancy units owned or managed by a single entity. Additional variations are possible where a central chiller is combined with multiple air handlers in individual occupancy units, such as apartments or separate retail or office spaces. For example, a landlord may enter into an overall demand response contract that calls for delivery of several megawatts or more of load shedding, and achieve that goal by managing the thermostats in individual units. The landlord may incentivize tenants to agree to participate by sharing some of the benefit of the demand response payments with tenants that cooperate, and allocating payment (or credit against payments owed by the tenant to the landlord) based on the degree to which the load was actually reduced in that unit. The processes described in Figures 7a through 7g may easily be adapted to accomplish this.

[0212] The system installed in a subscriber's home may optionally include additional temperature sensors at different locations within the building. These additional sensors may be connected to the rest of the system via a wireless system such as 802.11 or 802.15.4, or may be connected via wires. Additional temperature and/or humidity sensors may allow increased accuracy of the system, which can in turn increase user comfort, energy savings or both.

[0213] The bi-directional communication between server 106 and thermostat 108 will also allow thermostat 108 to regularly measure and send to server 106 information about the temperature in the conditioned space. By comparing outside temperature, inside temperature, thermostat settings, cycling

behavior of the HVAC system, and other variables, the system will be capable of numerous diagnostic and controlling functions beyond those of a standard thermostat.

[0214] For example, **Fig. 24a** shows a graph of inside temperature and outside temperature for a 24-hour period in conditioned space A, assuming no HVAC activity. Conditioned space A has double-glazed windows and is well insulated. When outside temperature 2502 increases, inside temperature 2504 follows, but with significant delay because of the thermal mass of the building.

[0215] **Figure 24b** shows a graph of inside temperature and outside temperature for the same 24-hour period in conditioned space B. Conditioned space B is identical to conditioned space A except that it (i) is located a block away and (ii) has single-glazed windows and is poorly insulated. Because the two spaces are so close to each other, outside temperature 2502 is the same in **Figure 24a** and **Figure 24b**. But the lower thermal mass of conditioned space B means that the rate at which the inside temperature 2506 changes in response to the changes in outside temperature is much greater.

[0216] The differences in thermal mass will affect the cycling behavior of the HVAC systems in the two conditioned spaces as well. **Figure 25a** shows a graph of inside temperature and outside temperature in conditioned space A for the same 24-hour period as shown in **Figure 24a**, but assuming that the air conditioning is being used to try to maintain an internal temperature of 70 degrees. Outside temperatures 2502 are the same as in **Figures 24a** and **24b**. Inside temperature 2608 is maintained within the range determined by thermostat 108 by the cycling of the air conditioner. Because of the high thermal mass of the conditioned space, the air conditioning does not need to run for very long to maintain the target temperature, as shown by shaded areas 2610.

[0217] **Figure 25b** shows a graph of inside temperature 2612 and outside temperature 2502 for the same 24-hour period in conditioned space B, assuming use of the air conditioning as in **Figure 25a**. Because of the lower thermal mass of conditioned space B, the air conditioning system in conditioned space B has to run longer in order to maintain the same target temperature range, as shown by shaded areas 2614.

[0218] Because server 106 logs the temperature readings from inside each conditioned space (whether once per minute or over some other interval), as well as the timing and duration of air conditioning cycles, database 300 will contain a history of the thermal performance of each system and each conditioned space. That performance data will allow the server 106 to calculate an effective thermal mass for each such structure – that is, the speed with the temperature inside a given conditioned space will change in response to changes in outside temperature and differences between inside and outside temperatures. Because the server 106 will also log these inputs against other inputs including time of day, humidity, etc. the server will be able to predict, at any given time on any given day, the rate at which inside temperature should change for given inside and outside temperatures.

[0219] The server will also record the responses of each occupancy unit to changes in outside conditions and cycling behavior over time. That will allow the server to diagnose problems as and when they develop. For example, **Figure 26a** shows a graph of outside temperature 2702, inside temperature 2704 and HVAC cycle times 2706 in conditioned space A for a specific 24-hour period on date X. Assume that, based upon comparison of the performance of conditioned space A on date X relative to conditioned space A's historical performance, and in comparison to the performance of conditioned space A relative to other nearby conditioned spaces on date X, the HVAC system in conditioned space A is presumed to be operating at normal efficiency, and that conditioned space A is in the 86th percentile as compared to those other conditioned spaces. **Figure 26b** shows a graph of outside temperature 2708, inside temperature 2710 and HVAC cycle times 2712 in conditioned space A for the 24-hour period on date X+1. Conditioned space A's HVAC system now requires significantly longer cycle times in order to try to maintain the same internal temperature. If those longer cycle times were due to higher outside temperatures, those cycle times probably would not indicate the existence of any problems. But because server 106 is aware of the outside temperature, the system can eliminate that possibility as an explanation for the higher cycle times. Because server 106 is aware of the cycle times in nearby conditioned spaces, it can determine that, for example, on date X+1 the efficiency of conditioned space

A is only in the 23rd percentile. The server may be programmed with a series of heuristics, gathered from predictive models and past experience, correlating the drop in efficiency and the time interval over which it has occurred with different possible causes. For example, a 50% drop in efficiency in one day may be correlated with a refrigerant leak, especially if followed by a further drop in efficiency on the following day. A reduction of 10% over three months may be correlated with a clogged filter. Based upon the historical data recorded by the server, the server 106 will be able to alert the appropriate responsible person that there is a problem and suggest a possible cause.

[0220] Because the system will be able to calculate effective thermal mass relative to each HVAC system or air handler, it will be able to determine the cost effectiveness of strategies such as pre-cooling for specific conditioned spaces under different conditions. **Figure 27a** shows a graph of outside temperature 2802, inside temperature 2804 and HVAC cycling times 2806 in conditioned space A for a specific 24-hour period on date Y assuming that the system has used a pre-cooling strategy to avoid running the air conditioning during the afternoon, when rates are highest. Because conditioned space A has high thermal mass, the space is capable of "banking" cooling, and energy consumed during off-peak hours is in effect stored, allowing the conditioned space to remain cool even when the system is turned off. Temperatures keep rising during the period the air conditioning is off, but because thermal mass is high, the rate of increase is low, and the conditioned space is still comfortable several hours later. Although the pre-cooling cycle time is relatively long, the effective ratepayer may still benefit if electricity prices vary at different times of the day, and if the price per kilowatt during the morning pre-cooling phase is lower than the price during the peak load period, or if other incentives are provided. **Figure 27b** shows a graph of the same outside temperature 2802 in conditioned space B as in conditioned space A in **Figure 27a** for the same 24-hour period and using the same pre-cooling strategy as shown by cycling times 2806. But because conditioned space B has significantly less thermal mass, using additional energy in order to pre-cool the space does not have the desired effect; inside temperature 2808 warms up so fast that the cooling that had been banked is quickly lost. Thus the system will recommend that conditioned space A

pre-cool in order to save money, but not recommend pre-cooling for conditioned space B.

[0221] The subject invention can also help compensate for anomalies such as measurement inaccuracies due to factors such as poor thermostat location. It is well known that thermostats should be placed in a location that will be likely to experience "average" temperatures for the overall conditioned space, and should be isolated from windows and other influences that could bias the temperatures they "see." But for various reasons, not all thermostat installations fit that ideal. **Figure 28a** shows a graph of outside temperature 2902, the actual average inside temperature for the entire conditioned space 2904, and inside temperature as read by the thermostat 2906 in conditioned space C for a specific 24-hour period on September 15th, assuming that the thermostat is located so that for part of the afternoon on that day the thermostat is in direct sunlight. Until the point at which the sun hits the thermostat, the average inside temperature and temperature as read by the thermostat track very closely. But when the direct sunlight hits the thermostat, the thermostat and the surrounding area can heat up, causing the internal temperature as read by the thermostat to diverge significantly from the average temperature for the rest of the conditioned space. A conventional thermostat has no way of distinguishing this circumstance from a genuinely hot day, and will both over-cool the rest of the conditioned space and waste considerable energy when it cycles the air conditioner in order to reduce the temperature as sensed by the thermostat. If the air conditioning remains off, this phenomenon will manifest as a spike in temperature as measured by the thermostat. If the air conditioning turns on (and has sufficient capacity to respond to the distorted temperature signal caused by the sunlight), this phenomenon will likely manifest as relatively small changes in the temperature as sensed by the thermostat, but significantly increased HVAC usage (as well as excessively lowered temperatures in the rest of the conditioned space, but this result may not be directly measured in a single-sensor environment). The subject system, in contrast, has multiple mechanisms that will allow it to correct for such distortions. First, because the subject system compares the internal readings from conditioned space C with the external temperature, it will be obvious that the rise in sensed temperature at 4:00PM is not correlated with a corresponding change

in outside temperature. Second, because the system is also monitoring the readings from the thermostat in nearby conditioned space D, which (as shown in **Figure 28b**) is exposed to the same outside temperature 602, but has no sudden rise in measured internal afternoon temperature 2908, the system has further validation that the temperature increase is not caused by climatic conditions. And finally, because the system has monitored and recorded the temperature readings from the thermostat in conditioned space C for each previous day, and has compared the changing times of the aberration with the progression of the sun, the system can distinguish the patterns likely to indicate solar overheating from other potential causes.

[0222] Another application for the subject invention is to determine the thermal characteristics of individual units within a larger building, and use that information to detect and recognize defects, and faults in the HVAC systems and building envelopes.

[0223] **Figure 29** illustrates the steps involved in calculating comparative thermal mass, or the thermal mass index for a specific conditioned space within a larger structure. In step 3002, the server retrieves climate data related to conditioned space X. Such data may include current outside temperature, outside temperature during the preceding hours, outside humidity, wind direction and speed, whether the sun is obscured by clouds, and other factors. In step 3004, the server retrieves HVAC duty cycle data for conditioned space X. Such data may include target settings for the thermostat in current and previous periods, the timing of switch-on and switch-off events and other data. In step 3006, the server retrieves data regarding recent temperature readings as recorded by the thermostat in conditioned space X. In step 3008, the server retrieves profile data for conditioned space X. Such data may include square footage, when the conditioned space was built and/or renovated, the extent to which it is insulated, its location within the larger structure, the make, model and age of the associated HVAC hardware specific that unit, and other data. In step 3010, the server retrieves the current inside temperature reading as transmitted by the thermostat. In step 3012, the server calculates the thermal mass index for the conditioned space under the relevant conditions; that is, for example, it may calculate the likely rate of change for internal temperature in conditioned space X

from a starting point of 70 degrees when the outside temperature is 85 degrees at 3:00PM on August 10th when the wind is blowing at 5 mph from the north and the sky is cloudy. The server may accomplish this by applying a basic algorithm that weighs each of these external variables as well as variables for various characteristics of the conditioned space itself (such as size, level of insulation, method of construction, etc.) and data from other conditioned spaces and environments.

[0224] This approach may be used to recognize and diagnose changes in operating parameters of the HVAC system over time, both generally and in individual units. **Figure 30** illustrates the steps involved in one method for diagnosing defects in the HVAC system for specific conditioned space X. In step 3102, the server retrieves climate data related to conditioned space X. Such data may include current outside temperature, outside temperature during the preceding hours, outside humidity, wind direction and speed, whether the sun is obscured by clouds, and other factors. In step 3104, the server retrieves HVAC duty cycle data for conditioned space X. Such data may include target settings for the thermostat in current and previous periods, the timing of switch-on and switch-off events and other data. In step 3106, the server retrieves data regarding current and recent temperature readings as recorded by the thermostat in conditioned space X. In step 3108, the server retrieves profile data for conditioned space X. Such data may include square footage, when the conditioned space was built and/or renovated, the extent to which it is insulated, its location within the larger structure, make, model and age of HVAC equipment associated with that specific unit, if any, and other data. In step 3110, the server retrieves comparative data from other conditioned spaces that have thermostats that also report to the server. Such data may include interior temperature readings, outside temperature for those specific locations, duty cycle data for the HVAC systems at those locations, profile data for the structures and HVAC systems associated with those conditioned spaces and the calculated thermal mass index for those other conditioned spaces. In step 3112, the server calculates the current relative efficiency of conditioned space X as compared to other conditioned spaces. Those comparisons will take into account differences in size, location, age, etc. in making those comparisons.

[0225] The server will also take into account that comparative efficiency is not absolute, but will vary depending on conditions. For example, a conditioned space that has extensive south-facing windows is likely to experience significant solar gain. On sunny winter days, that home will appear more efficient than on cloudy winter days. That same conditioned space will appear more efficient at times of day and year when trees or overhangs shade those windows than it will when summer sun reaches those windows. Thus the server may calculate efficiency under varying conditions.

[0226] For example, in step 3114 the server compares the HVAC system's efficiency, corrected for the relevant conditions, to its efficiency in the past. If the current efficiency is substantially the same as the historical efficiency, the server concludes 3116 that there is no defect and the diagnostic routine ends. If the efficiency has changed, the server proceeds to compare the historical and current data against patterns of changes known to indicate specific problems. For example, in step 3118, the server compares that pattern of efficiency changes against the known pattern for a clogged air filter, which is likely to show a slow, gradual degradation over a period of weeks or even months. If the pattern of degradation matches the clogged filter paradigm, the server creates and transmits to the appropriate party a message 3120 alerting the party to the possible problem. If the problem does not match the clogged filter paradigm, the system compares 3122 the pattern to the known pattern for a refrigerant leak, which is likely to show degradation over a period of a few hours to a few days. If the pattern of degradation matches the refrigerant leak paradigm, the server creates and transmits to the appropriate party a message 3124 alerting the party to the possible problem. If the problem does not match the refrigerant leak paradigm, the system compares 3126 the pattern to the known pattern for an open window or door, which is likely to show significant changes for relatively short periods at intervals uncorrelated with climatic patterns. If the pattern of degradation matches the open door/window paradigm, the server creates and transmits to the appropriate party a message 3128 alerting the party to the possible problem. If the problem does not match the open door/window paradigm, the system continues to step through remaining know patterns N 3130

until either a pattern is matched 3132 or the list has been exhausted without a match 3134.

[0227] Figure 31 illustrates the steps involved in one method for diagnosing inaccurate thermostat readings due to improper location. In step 3202, the server retrieves climate data related to conditioned space X. Such data may include current outside temperature, outside temperature during the preceding hours, outside humidity, wind direction and speed, whether the sun is obscured by clouds, and other factors. In step 3204, the server retrieves HVAC duty cycle data for conditioned space X. Such data may include target settings for the thermostat in current and previous periods, the timing of switch-on and switch-off events and other data. In step 3206, the server retrieves data regarding current and recent temperature readings as recorded by the thermostat in conditioned space X. In step 3208, the server retrieves profile data for conditioned space X. Such data may include square footage, when the space was built and/or renovated, the extent to which it is insulated, its location within the larger structure, make, model and age of HVAC hardware specific to that space, if any, and other data. In step 3210, the server retrieves comparative data from other conditioned spaces that have thermostats that also report to the server. Such data may include interior temperature readings, outside temperature for those specific locations, duty cycle data for the HVAC systems at those locations, profile data for the structures and HVAC systems in those conditioned spaces and the calculated thermal mass index for those other conditioned spaces. In step 3212, the server calculates the expected thermostat temperature reading based upon the input data. In step 3214, the server compares the predicted and actual values. If the calculated and actual values are at least roughly equivalent, the server concludes 3216 that there is no thermostat-related anomaly. If the calculated and actual values are not roughly equivalent, the server retrieves additional historical information about past thermostat readings in step 3218. In step 3220, the server retrieves solar progression data, i.e., information regarding the times at which the sun rises and sets on the days being evaluated at the location of the conditioned space being evaluated, and the angle of the sun at that latitude, etc. In step 3222, the server compares the characteristics of the anomalies over time, to see if, for example, abnormally high

readings began at 3:12 on June 5th, 3:09 on June 6th, 3:06 on June 7th, and the solar progression data suggests that at the conditioned space being analyzed, that sun would be likely to reach a given place in that unit three minutes earlier on each of those days. If the thermostat readings do not correlate with the solar progression data, the server may conclude 3224 that the sun is not causing the distortion by directly hitting the thermostat. If the thermostat readings do correlate with solar progression, the server then calculates 3226 the predicted duration of the distortion caused by the sun. In step 3228, the server calculates the appropriate setpoint information to be used by the thermostat to maintain the desired temperature and correct for the distortion for the expected length of the event. For example, if the uncorrected setpoint during the predicted event is 72 degrees, and the sun is expected to elevate the temperature reading by eight degrees, the server will instruct the thermostat to maintain a setpoint of 80 degrees. In step 3230, the server sends the appropriate party a message describing the problem.

[0228] The instant invention may also be used to implement additional energy savings by implementing small, repeated changes in setpoint for individual conditioned spaces. Because energy consumption is strongly correlated with setpoint – that is, the further a given setpoint diverges from the balance point (the natural inside temperature assuming no HVAC activity) in a given conditioned space under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. It is therefore possible to save energy by adopting a strategy that takes advantage of human insensitivity to slow temperature ramping by incorporating a user's desired setpoint within the range of the ramp, but setting the average target temperature below the desired setpoint in the case of heating, and above it in the case of cooling. For example, a ramped summer setpoint that consisted of a repeated pattern of three phases of equal length set at 72°F, 73°F, and 74°F would create an effective average setpoint of 73°F, but would generally be experienced by occupants as yielding equivalent comfort as in a room set at a constant 72°F. Energy savings resulting from this approach have been shown to be in the range of 4-6%.

[0229] The subject invention can automatically generate optimized ramped setpoints for individual conditioned spaces in a larger building that could save energy without compromising the comfort of the occupants. It would also be advantageous to create a temperature control system that could incorporate adaptive algorithms that could automatically determine when the ramped setpoints should not be applied due to a variety of exogenous conditions that make application of such ramped setpoints undesirable.

[0230] **Figure 32** represents the conventional programming of a thermostat and the resulting behavior of a conditioned space's HVAC system in the air conditioning context. The morning setpoint 3302 of 74 degrees remains constant from midnight until 9:00AM, and the inside temperature 3304 varies more or less within the limits of the hysteresis band (which is generally set by the thermostat) during that entire period. When the setpoint changes to 80 degrees 3306, the inside temperature 3308 rises until it reaches and then varies within the hysteresis band around the new setpoint, and so on. Whether the average temperature is equal to, greater or less than the nominal setpoint will depend on weather conditions, the dynamic signature of the structure, and the efficiency and size of the HVAC system. But in most cases the average temperature will be at least roughly equivalent to the nominal setpoint.

[0231] **Figure 33** represents implementation of a three-phase ramped setpoint derived from the same user preferences as manifested by the settings shown in figure 32. Thus the user-selected setpoint for the morning is still 74 degrees, and is reflected in the setpoint 3404 at the start of each three-step cycle, but because (in the air conditioning context) the setpoint requested by the user is the lowest of the three discrete steps, rather than the middle step, the average setpoint will be one degree higher 3402 (in the case of 1 degree steps between setpoints), and the resulting average inside temperature will be roughly one degree warmer than the average temperature without use of the ramped setpoints, thereby saving energy.

[0232] In the currently preferred embodiment, the implementation of the ramped setpoints may be dynamic based upon both conditions inside the structure and other planned setpoint changes. Thus, for example, the ramped setpoints 3406, 3408 and 3410 may be timed so that the 9AM change in user-

determined setpoint from 74 degrees to 80 degrees is in effect anticipated, and the period in which the air conditioner is not used can be extended prior to the scheduled start time for the less energy-intensive setpoint. Similarly, because the server 106 is aware that a lower setpoint will begin at 5PM, the timing can be adjusted to avoid excessively warm temperatures immediately prior to the scheduled setpoint change, which could cause noticeable discomfort relative to the new setpoint if the air conditioner is incapable of quickly reducing inside temperature on a given day based upon the expected slope of inside temperatures at that time 3412.

[0233] In order to implement such ramped setpoints automatically, algorithms may be created. These algorithms may be generated and/or executed as instructions on remote server 106 and the resulting setpoint changes can be transmitted to a given thermostat on a just-in-time basis or, if the thermostat 108 is capable of storing future settings, they may be transferred in batch mode to such thermostats. Basic parameters used to generate such algorithms include:

- the number of discrete phases to be used;
- the temperature differential associated with each phase; and
- the duration of each phase.

[0234] In order to increase user comfort and thus maximize consumer acceptance, additional parameters may be considered, including:

- time of day
- outside weather conditions
- recent history of manual inputs; and
- recent pre-programmed setpoint changes.

[0235] Time of day may be relevant because, for example, if the home is typically unoccupied at a given time, there is no need for perceptual programming. Outside weather is relevant because comfort is dependent not just on temperature as sensed by a thermostat, but also includes radiant differentials. On extremely cold days, even if the inside dry-bulb temperature is within normal comfort range, radiant losses due to cold surfaces such as single-glazed windows can cause subjective discomfort; thus on such days occupants may be more sensitive to ramping. Recent manual inputs (e.g., programming overrides) may create situations in which exceptions should be taken; depending on the context,

recent manual inputs may either suspend the ramping of setpoints or simply alter the baseline temperature from which the ramping takes place.

[0236] **Figure 34** shows the steps used in an embodiment of the core ramped setpoint algorithm in the context of a remotely managed thermostat system. In step 3502 the application determines whether to instantiate the algorithm based upon external scheduling criteria. Such information may include previously learned occupancy patterns, previously learned temperature preferences, responses to previous implementations of energy-savings strategies, etc. In step 3504 the application running on a remote server retrieves from the thermostat the data generated by or entered into the thermostat, including current temperature settings, HVAC status and inside temperature. The algorithm performs preliminary logical tests at that point to determine whether further processing is required. For example, in the heating context, if the inside temperature as reported by the thermostat 108 is more than 1 degree higher than the current setpoint, the algorithm may determine that running the ramped setpoint program will have no effect and therefore terminate. In step 3506 the algorithm advances to the next phase from the most recent phase; i.e., if the algorithm is just starting, the phase changes from "0" to "1"; if it has just completed the third phase of a three-phase ramp, the phase will change from "2" to "0". In step 3508 the application determines if the current phase is "0". If it is, then in step 3510 the algorithm determines whether current setpoint equals the setpoint in the previous phase. If so, which implies no manual overrides or other setpoint adjustments have occurred during the most recent phase, then in step 3512 the algorithm sets the new setpoint back to the previous phase "0" setpoint. If not, then in step 3514, the algorithm keeps the current temperature setting as setpoint for this new phase. In step 3516, the algorithm logs the resulting new setpoint as the new phase "0" setpoint for use in subsequent phases.

[0237] Returning to the branch after step 3508, if the current phase at that point is not phase "0", then in step 3520, the algorithm determines whether the current setpoint is equal to the setpoint temperature in the previous phase. If not, which implies setpoints have been adjusted by the occupants, thermostat schedules, or other events, then in step 3522, the application resets the phase to "0", resets the new setpoint associated with phase "0" to equal the current

temperature setting, and sets the current setting to that temperature. Alternatively, if the current temperature setting as determined in step 3520 is equal to the setpoint in the previous phase, then in step 3524 new setpoint is made to equal current setpoint plus the differential associated with each phase change. In step 3526 the "previous-phase setpoint" variable is reset to equal the new setpoint in anticipation of its use during a subsequent iteration.

[0238] Figure 35 shows one embodiment of the overall control application implementing the algorithm described in Figure 35. In step 3602, the control application retrieves the current setting from the thermostat. In step 3604, the setting is logged in database 300. In step 3606, the control program determines whether other algorithms that have higher precedence than the ramped setpoint algorithm are to be run. If another algorithm is to be run prior to the ramped setpoint algorithm, then the other program is executed in step 3608. If there are no alternate algorithms that should precede the ramped setpoint application then in step 3610, the control program determines whether the thermostat has been assigned to execute the ramped setpoint program. If not, the control program skips the remaining actions in the current iteration. If the program is set to run, then in step 3612 the algorithm retrieves from database 300 the rules and parameters governing the implementation of the algorithm for the current application of the program. In step 3614, the algorithm determines whether one or more conditions that preclude application of the algorithm, such as extreme outside weather conditions, whether the home is likely to be occupied, execution of a conflicting algorithm, etc. If any of the exclusionary conditions apply, the application skips execution of the ramped setpoint algorithm for the current iteration. If not, the application proceeds to step 3616 in which the application determines whether the setpoint has been altered by manual overrides, thermostat setback schedule changes, or other algorithms as compared to the previous value as stored in database 300. If the setpoint has been altered, the application proceeds to step 3620 discussed below. In step 3618, the program described in Figure 34 is executed. In step 3620, the application resets the phase to "0". Certain temperature setting variables are reset in anticipation of their use in subsequent phases. These variables include the new phase 0 temperature setting, which is anchored to the current actual

temperature setting, and the new previous-phase setpoint, which will be used for identifying setpoint, overrides in the subsequent phase.

[0239] In step 3622, the system records the changes to the thermostat settings to database 300. In step 3624, the system records the changes to the phase status of the algorithm to database 300. In step 3626, the application determines whether the new temperature setting differs from the current setting. If they are the same, the application skips applying changes to the thermostat. If they are different, then in step 3628, the application transmits revised settings to the thermostat. In step 3630, the application then hibernates for the specified duration until it is invoked again by beginning at step 3602 again.

[0240] The subject invention may also be used to detect occupancy of a specific conditioned space through the use of software related to electronic devices located inside the conditioned structure, such as the browser running on computer or other device 104. **Figure 36** represents the screen of a computer, television or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 3700 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Conversely, a lack of activity on devices normally associated with an individual occupancy unit may suggest, but cannot conclusively show, that the unit is occupied. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy (or that non-occupancy has been inferred when occupancy is assumed to be the norm); (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 3702 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 3704 or "No" button 3706. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

[0241] **Figure 37** is a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 3802, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 3804 the application queries database 300 to retrieve setting information for the associated HVAC system. In step 3806 the application determines whether the current HVAC program is intended to apply when the conditioned space is occupied or unoccupied. If the HVAC settings then in effect are intended to apply to an occupied unit, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 3808 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 3816, in which it changes the programmed setpoint for the thermostat to the setting intended for the conditioned space when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 3810 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied conditioned space and asking the user in step 3812 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied conditioned space. If the user elects to retain the current setting, then in step 3814 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 3816 the application transmits the revised setpoint to the thermostat. In step 3814 the application writes the updated setting information to database 300. Similar logic may be used to proceed from a lack of activity on computer 104 to a conclusion that the HVAC settings should be optimized for an unoccupied state.

[0242] **Figure 38** is a flowchart that shows how the subject invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer or other device

connected to the system. In step 3902 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 3904 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 3906 server 106 retrieves previously stored data regarding the occupants of the conditioned space. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 3908, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's programming, server 106 may conclude that a child is watching. In step 3910 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you, Bob?" In step 3912, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 3916. If the answer is yes, then in step 3914 the application retrieves the temperature preferences for the identified occupant. In step 3916 the application writes to database 300 the programming information and information regarding matching of users to that programming.

[0243] In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 106

of this trigger, server 106 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

[0244] Alternatively, server 106 may use biometric data provided by computer 104, such as fingerprints (which some computers and other devices now require for log-in), retinal scans, or other methods for identifying the user of an electronic device.

[0245] Those skilled in the relevant arts will likely recognize ways to apply the subject invention in additional contexts. In addition to use with chiller-based HVAC systems as described herein, the subject invention is also capable of use with other centralized systems including steam boilers, hydronic centralized heating, etc. The subject invention will be of value whenever a central plant is used to deliver space conditioning to separately owned or rented spaces, regardless of the means of generating and moving the conditioning (heating or cooling) medium.

[0246] Embodiments of the invention are also described above with reference to flow chart illustrations and/or block diagrams of methods, components, apparatus, systems, and the like. It will be understood that each block of the flow chart illustrations and/or block diagrams as well as each component, apparatus and system can be individually implemented or in any combination.

[0247] While particular embodiments of the present invention have been shown and described, it is apparent that changes and modifications may be made without departing from the invention in its broader aspects, and, therefore, that the invention may be carried out in other ways without departing from the true spirit and scope.

WHAT IS CLAIMED IS:

1. A system for allocating the cost of operating an HVAC system where the HVAC system comprises at least a first component that consumes energy based at least in part on whether equipment associated with an individual unit of occupancy in a building comprised of a plurality of occupancy units is "on" or "off", and at least a second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not the first component is "on or "off", the HVAC system comprising:

a thermostatic controller comprising a thermostat, the thermostatic controller configured to that turn on or off a first component that is associated with an individual unit of occupancy at least in part based on temperature readings from inside the individual unit of occupancy, and that is capable of reporting that the first component that is associated with the individual unit of occupancy is on or off;

at least a processor not located inside the individual unit of occupancy that is in communication with the thermostat;

a database for storing data reported by the thermostat; and

where at least the run time associated with the first component that is associated with the individual unit of occupancy as reported by the thermostatic controller is a determinant of the cost of operation of a second component that is associated with a plurality of units allocated to the individual unit of occupancy.

2. A system as in claim 1 in which the second component includes at least a central chiller.

3. A system as in claim 1 in which the individual unit of occupancy is an apartment.

4. A system as in claim 1 in which the thermostatic controller communicates at least in part via a wireless network.

5. A system as in claim 1 in which the thermostatic controller communicates at least in part via the Internet.

6. A system as in claim 1 in which the medium used to transfer heat between the first component and the second component is water.

7. A system as in claim 1 in which the medium used to transfer heat between the first component and the second component is steam.

8. A system as in claim 1 in which the individual unit of occupancy is a non-residential commercial space.

9. A system as in claim 1 in which the building comprises multiple stories.

10. A method for allocating the cost of operating an HVAC system where the HVAC system comprises at least a first component that consumes energy based at least in part on whether equipment associated with an individual unit of occupancy in a building comprised of a plurality of occupancy units is "on" or "off", and at least a second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not said first component is "on or "off", the method comprising:

measuring the runtime of a first component with a thermostatic controller that turns on or off said first component that is associated with the individual unit of occupancy at least in part based on temperature readings from inside the individual unit of occupancy, and that is capable of reporting that the first component that is associated with the individual unit of occupancy is on or off;

measuring the runtime of at least the second component that is associated with a plurality of occupancy units that consumes energy at least in part whether or not the first component is "on or "off";

calculating the cost of operating the HVAC system to be allocated to the individual unit of occupancy based at least in part on the run time associated with the first component that is associated with the individual unit of occupancy as reported by the thermostatic controller relative to the cost of operation of the second component that is associated with a plurality of units allocated to the individual unit of occupancy.

11. A method as in claim 10 in which the second component includes at least a central chiller.

12. A method as in claim 10 in which the individual unit of occupancy is an apartment.

13. A method as in claim 10 in which the thermostatic controller communicates at least in part via a wireless network.

14. A method as in claim 10 in which the thermostatic controller communicates at least in part via the Internet.

15. A method as in claim 10 in which the medium used to transfer heat between the first component and the second component is water.

16. A method as in claim 10 in which the medium used to transfer heat between the first component and the second component is steam.

17. A method as in claim 10 in which the individual occupancy units are non-residential commercial spaces.

18. A method as in claim 10 in which the building comprises multiple stories.

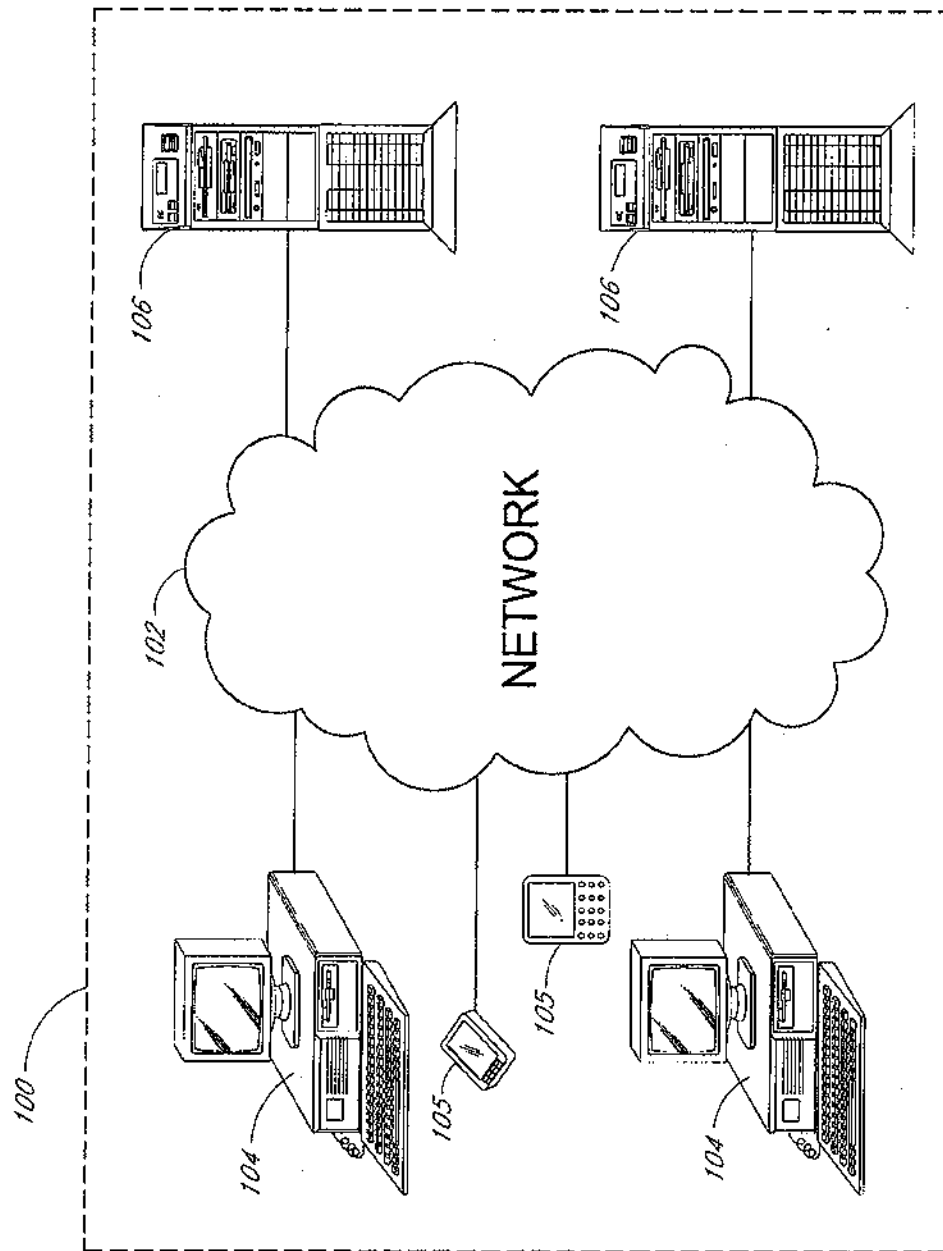


FIG. 1

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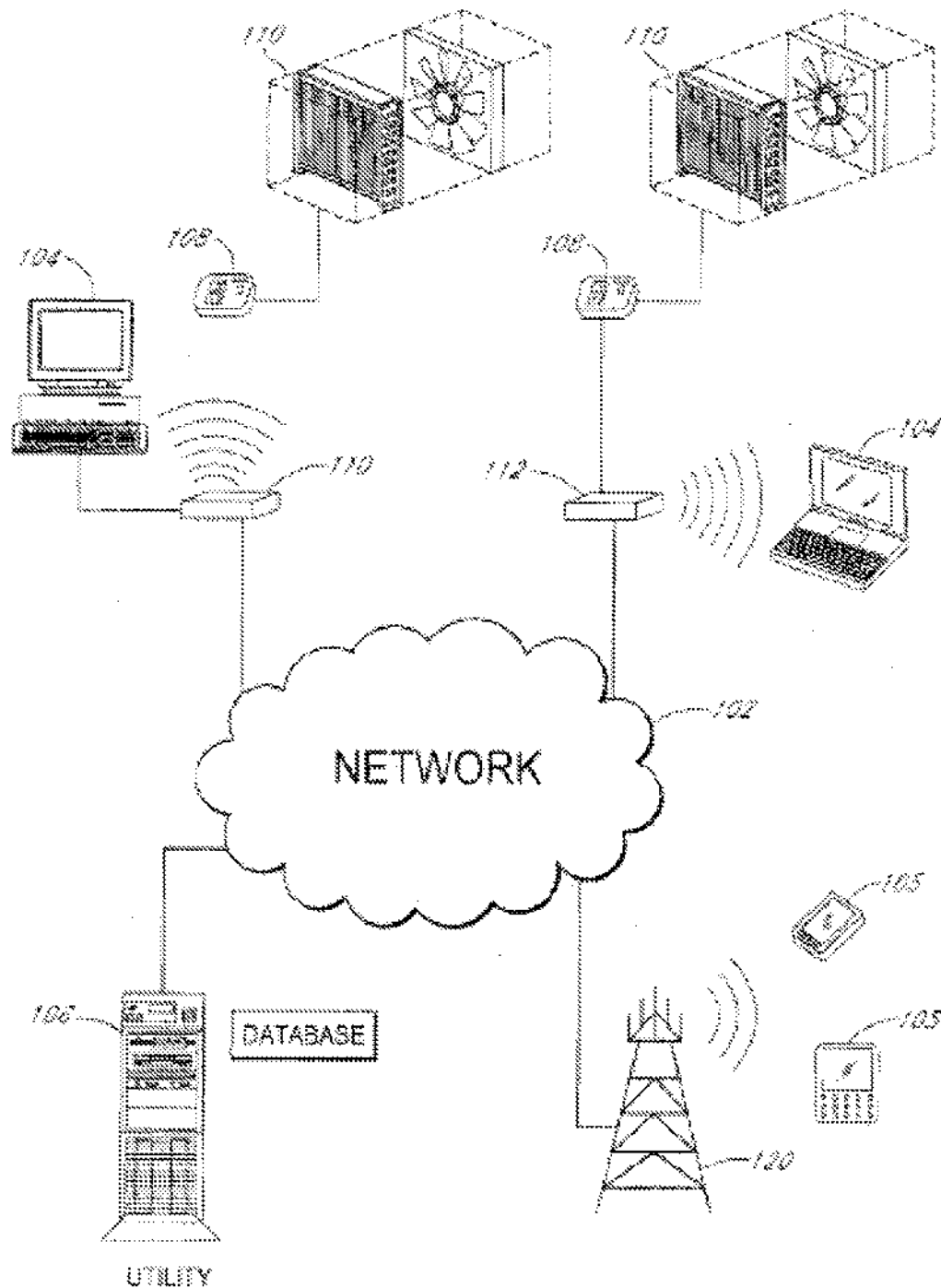


FIG. 2

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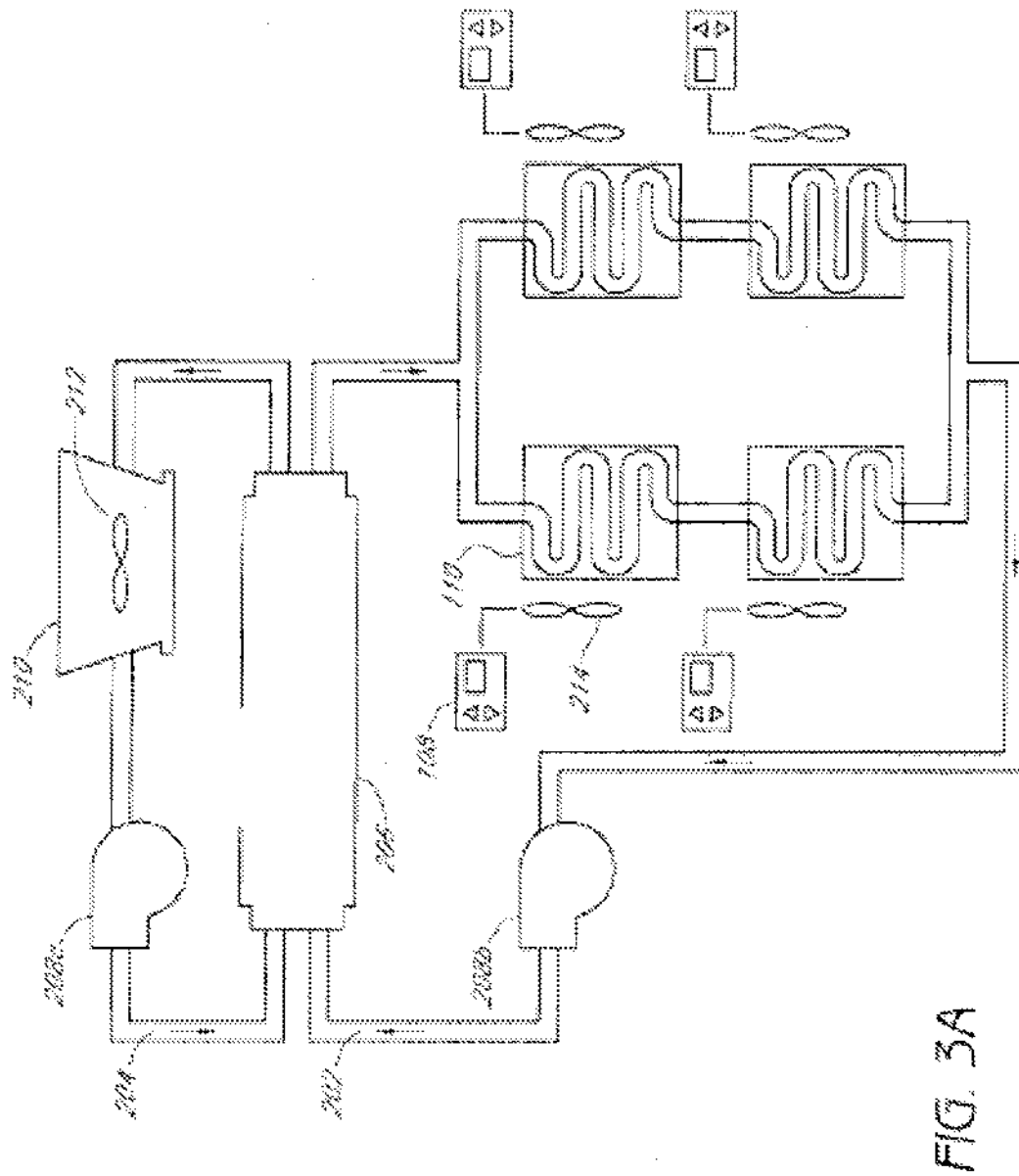


FIG. 3A

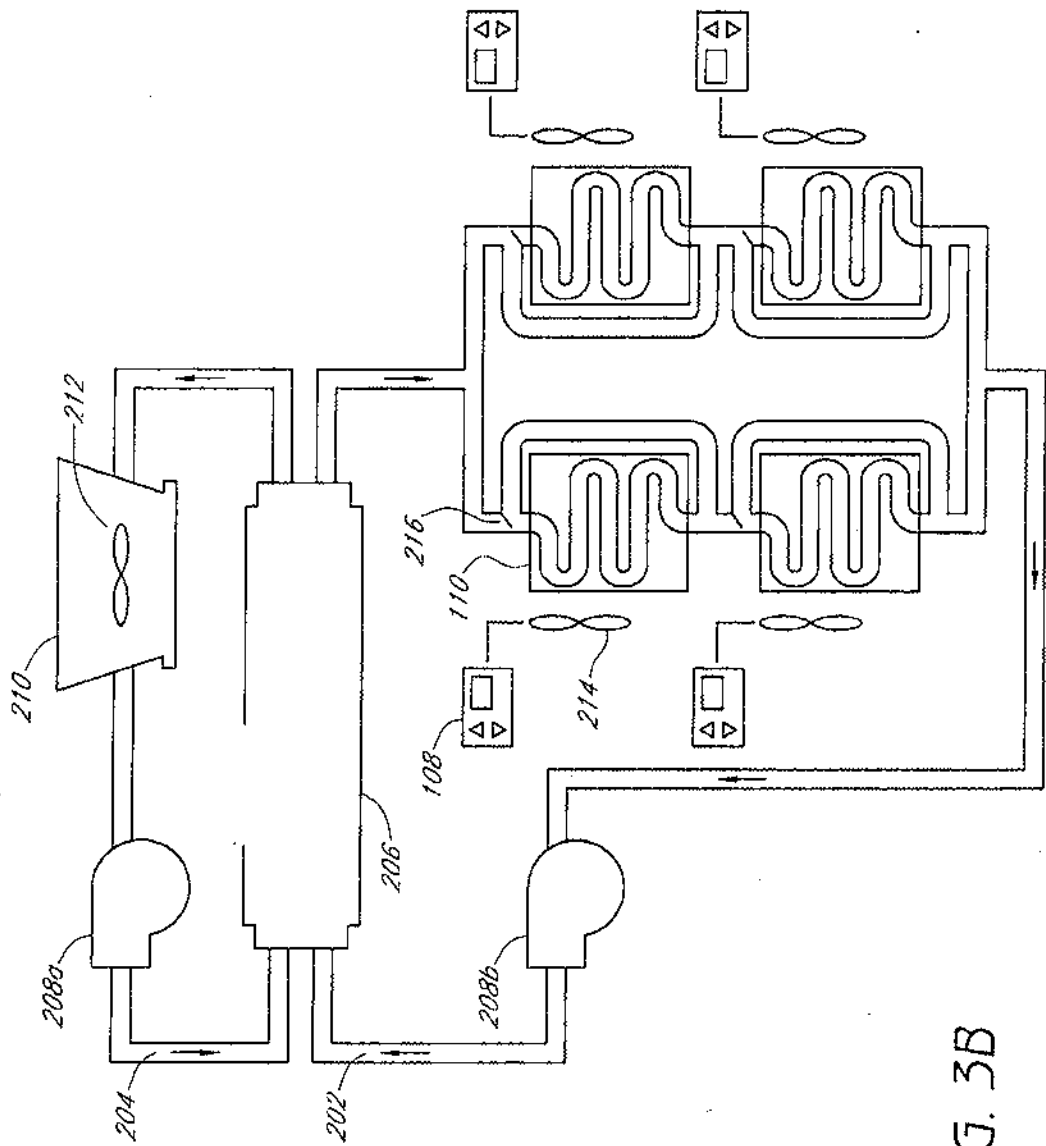


FIG. 3B

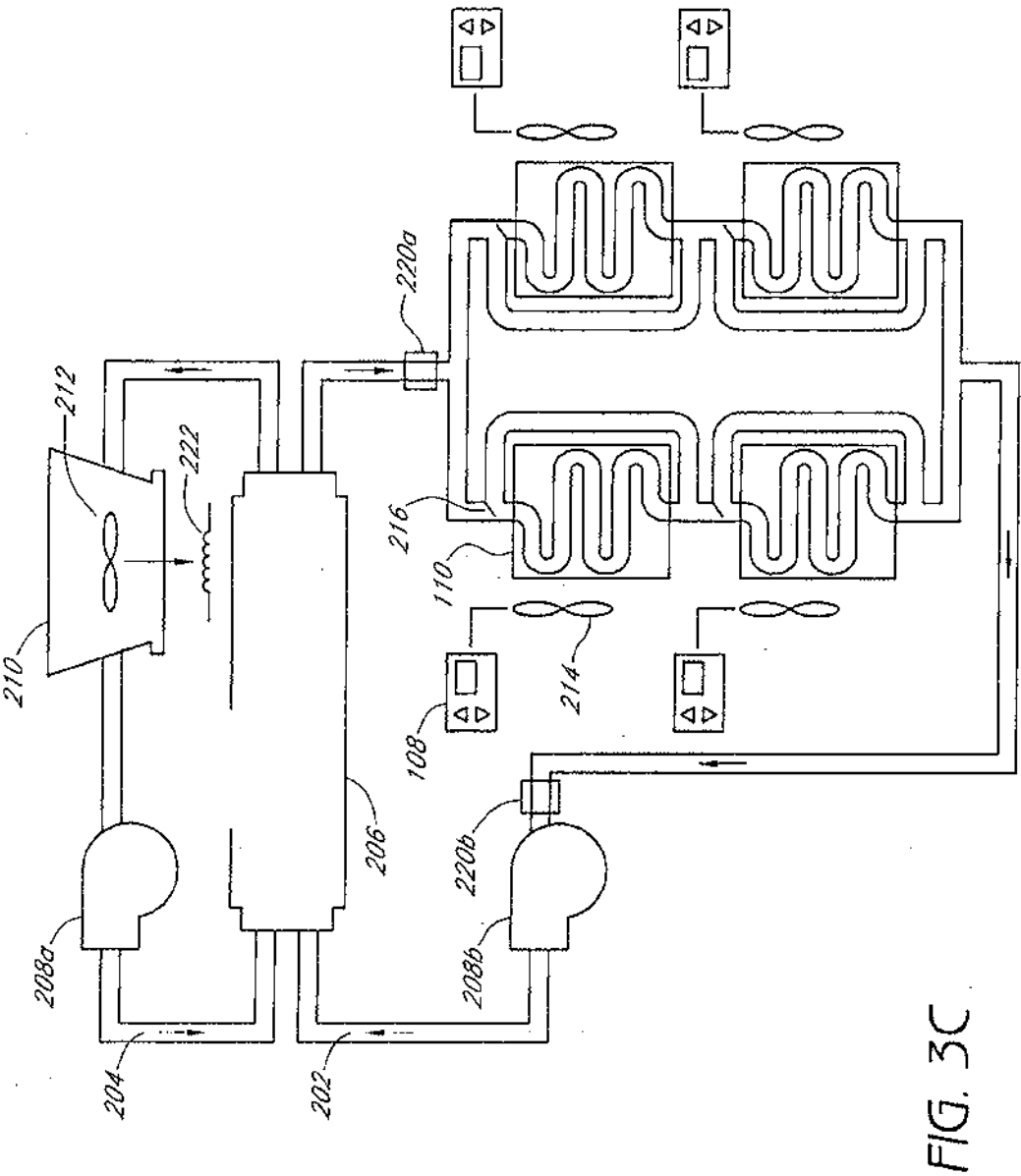


FIG. 3C

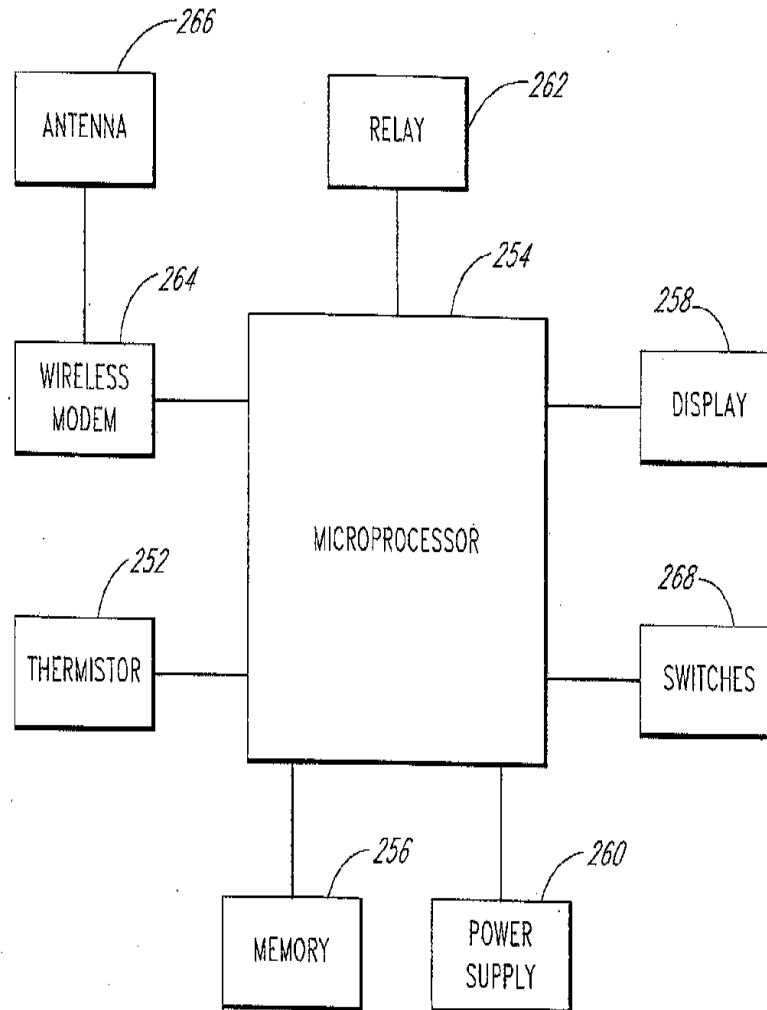


FIG. 4

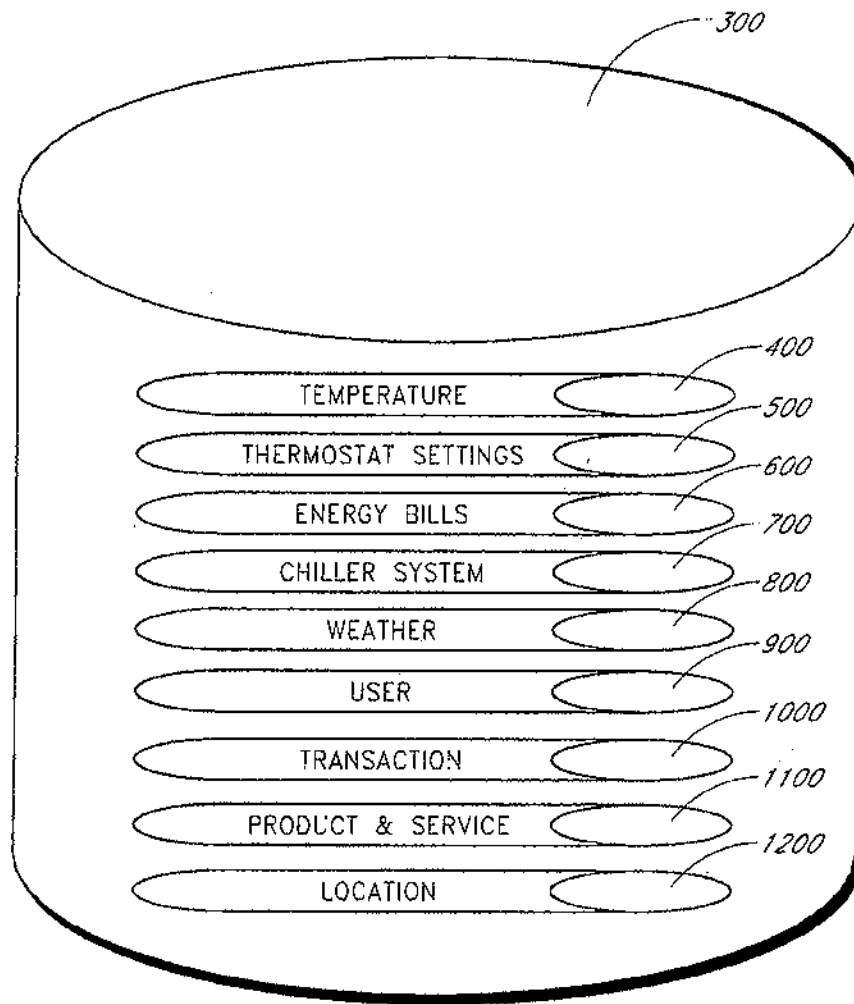


FIG. 5

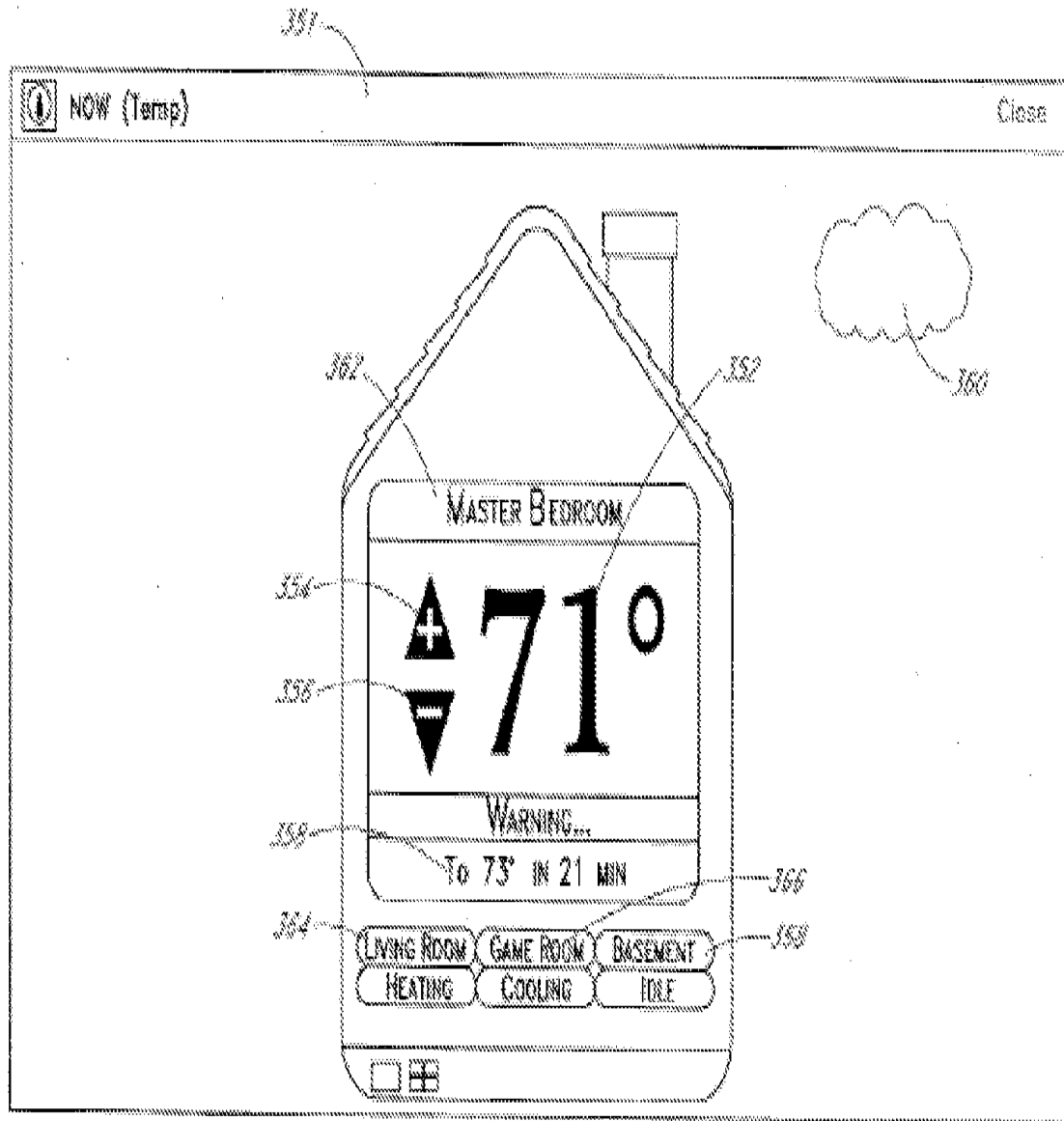


FIG. 6A

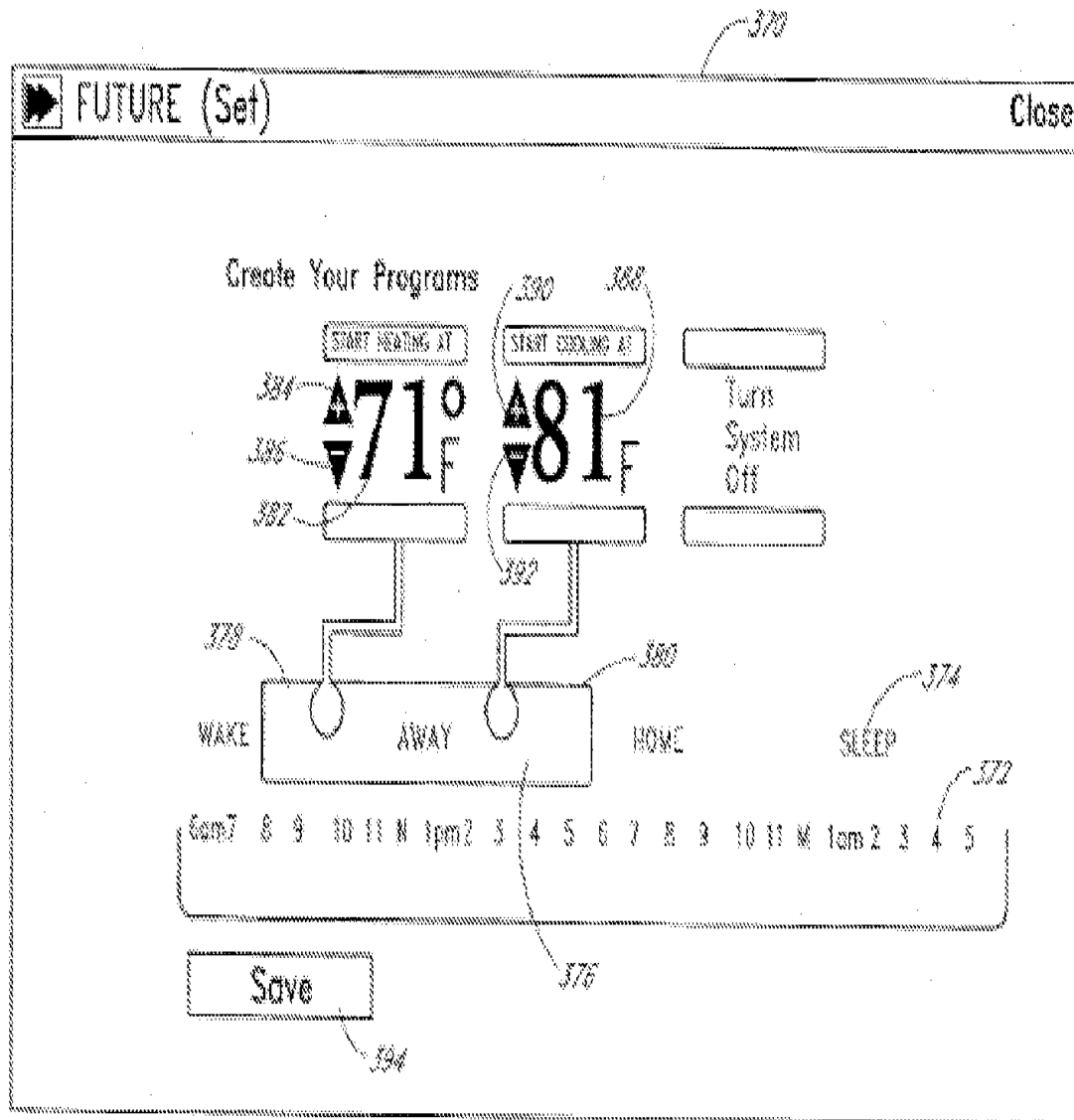


FIG. 6B

[illegible]

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2000年12月15日

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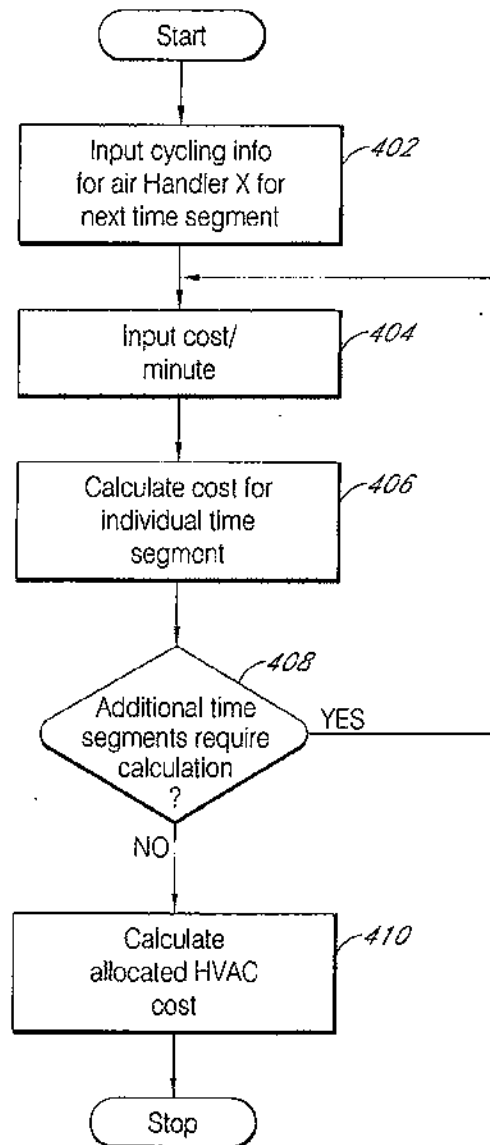


FIG. 7A

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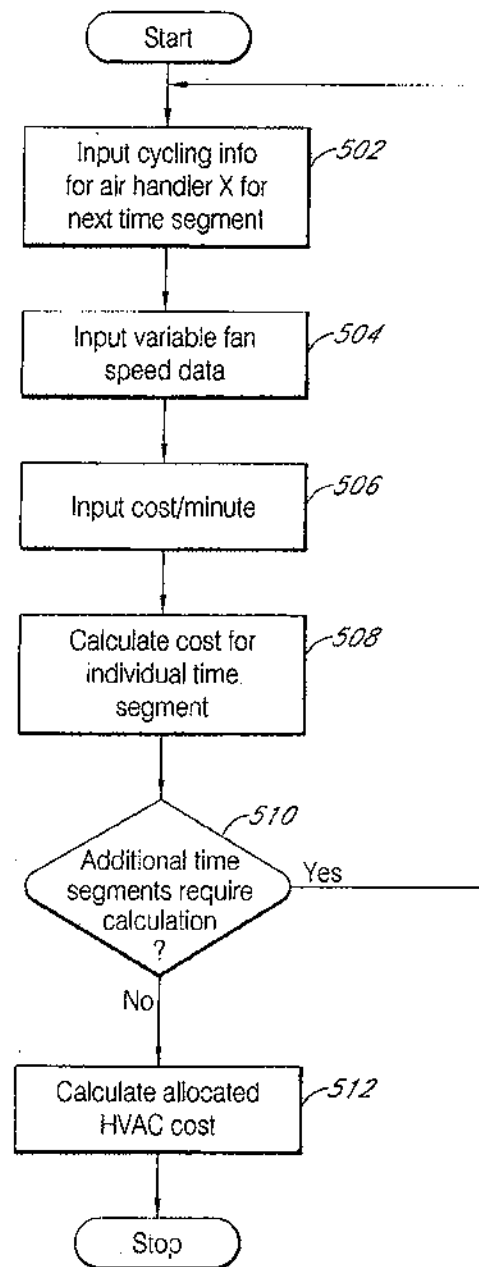


FIG. 7B

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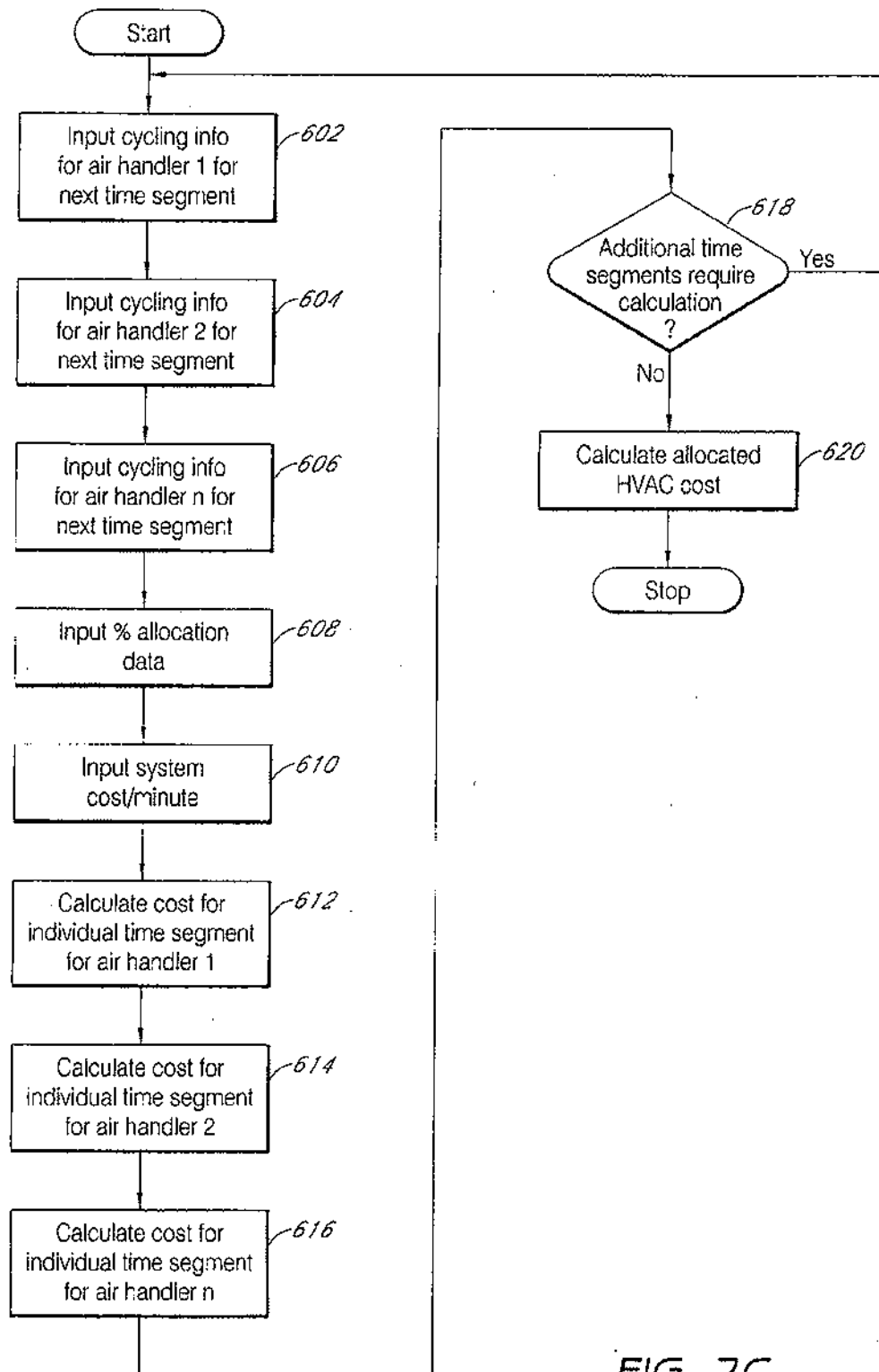
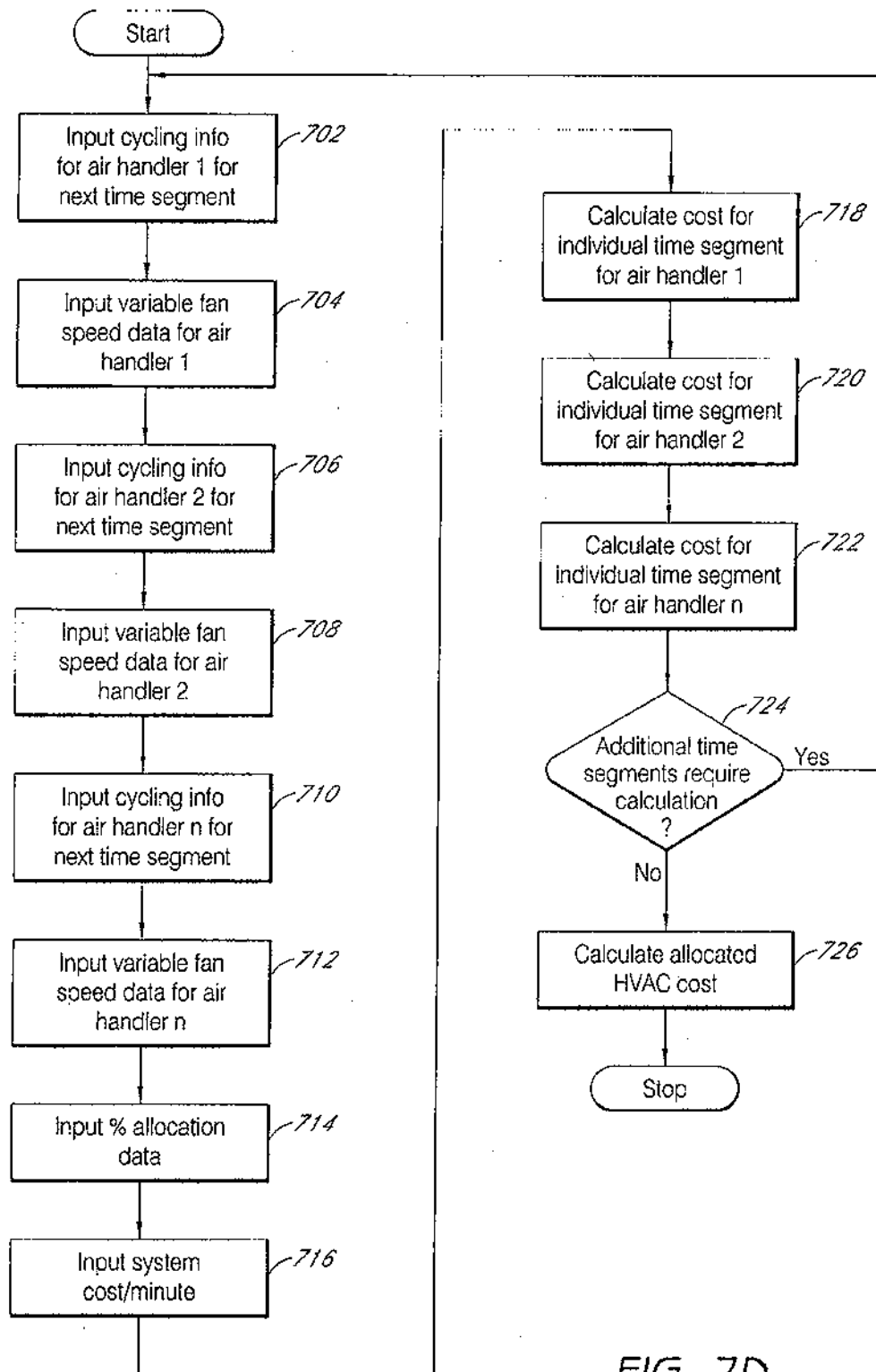


FIG. 7C



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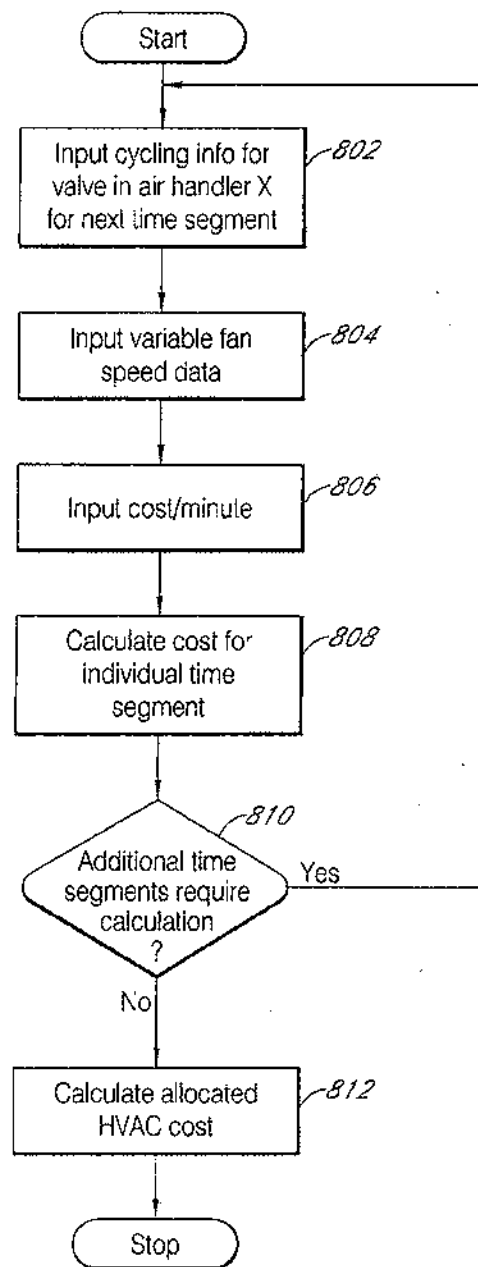


FIG. 7E

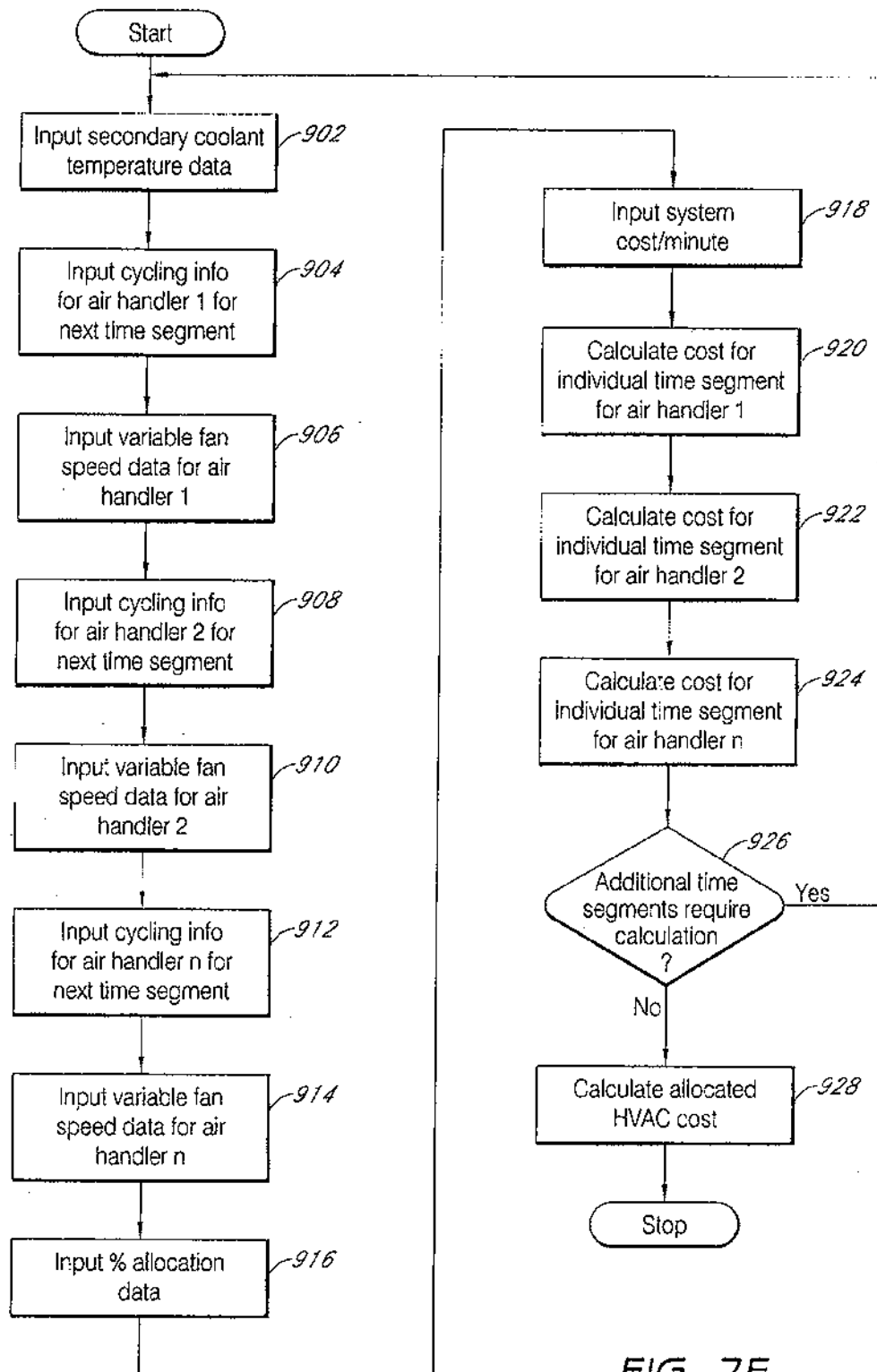


FIG. 7F

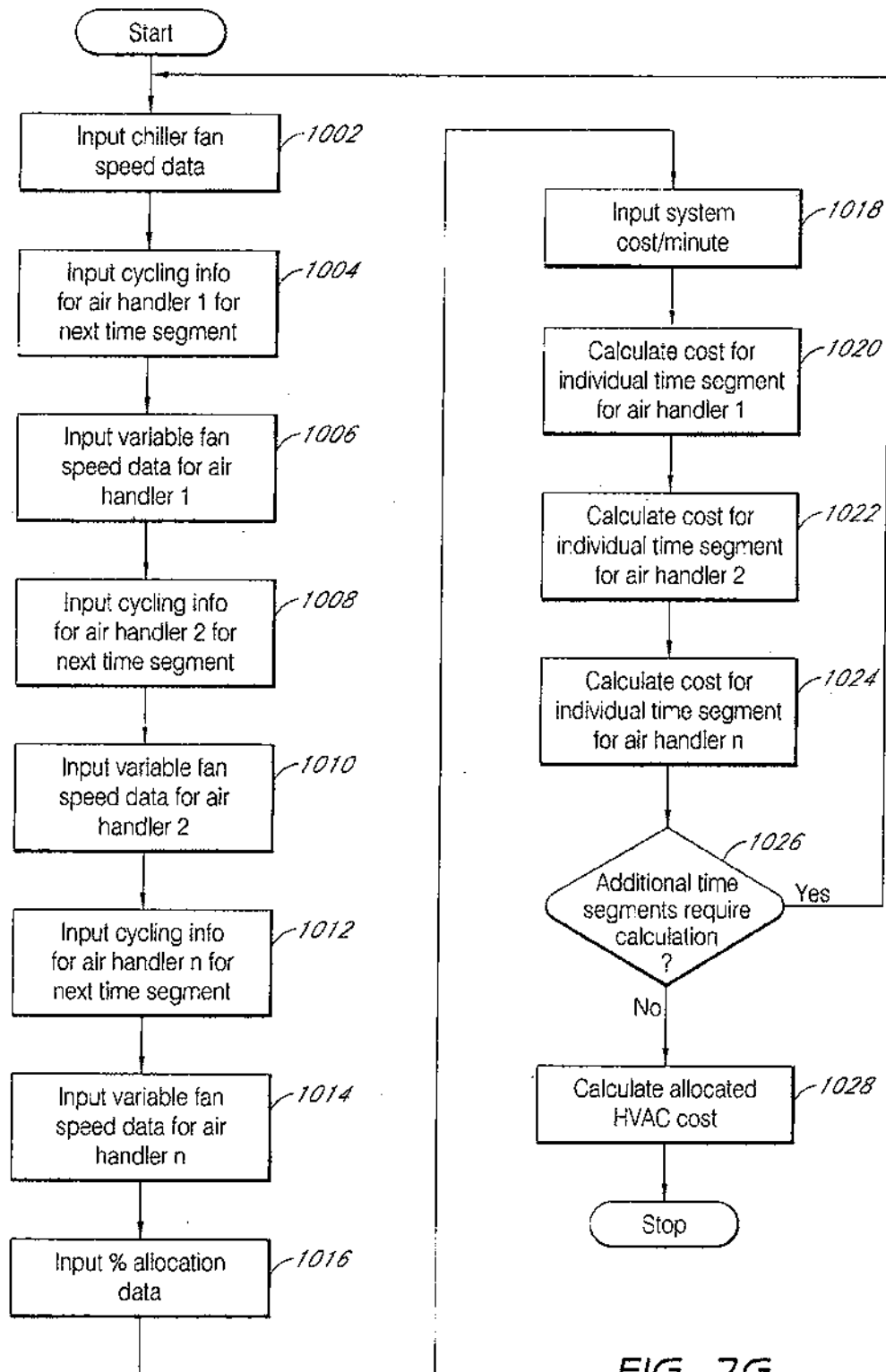


FIG. 7G

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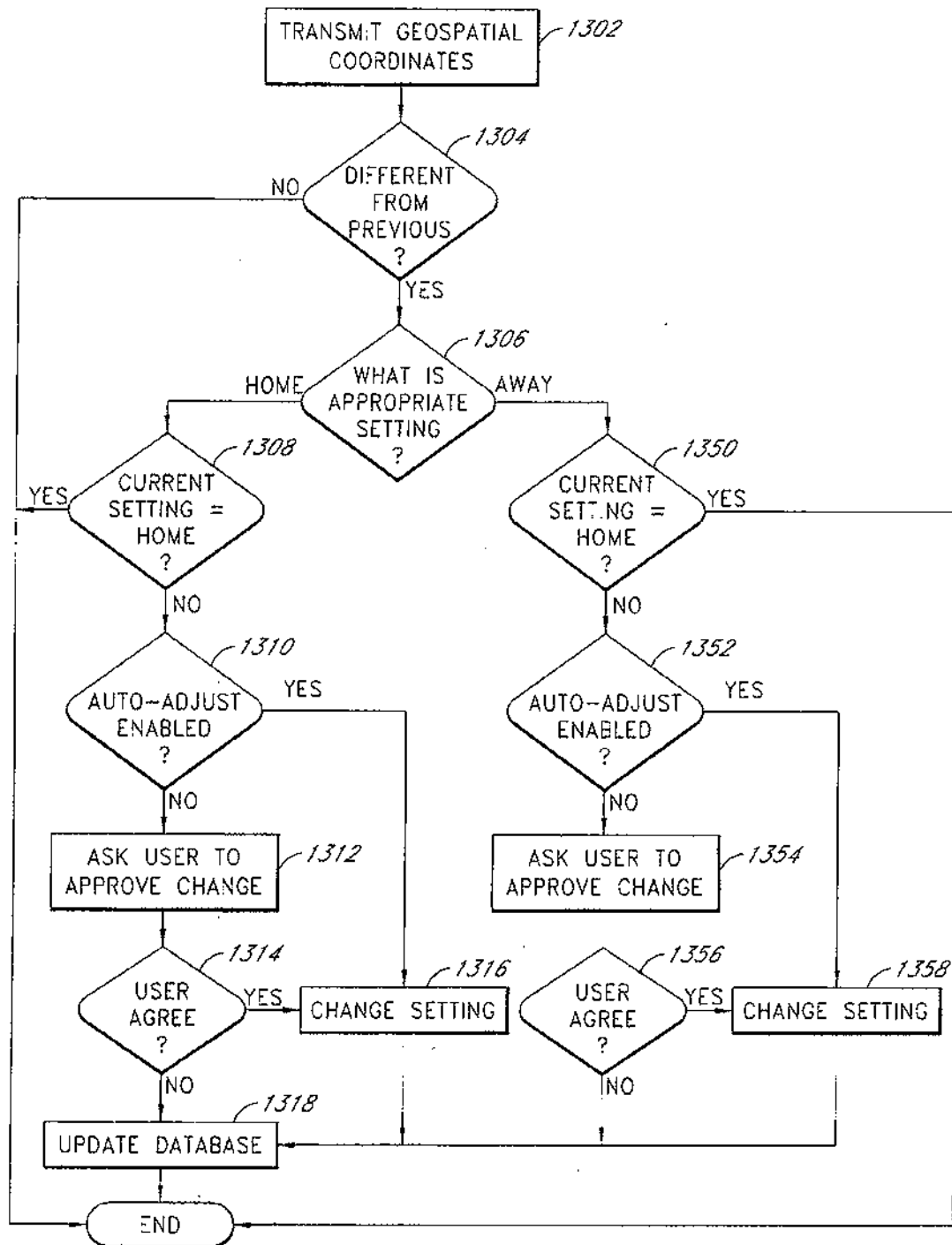


FIG. 8

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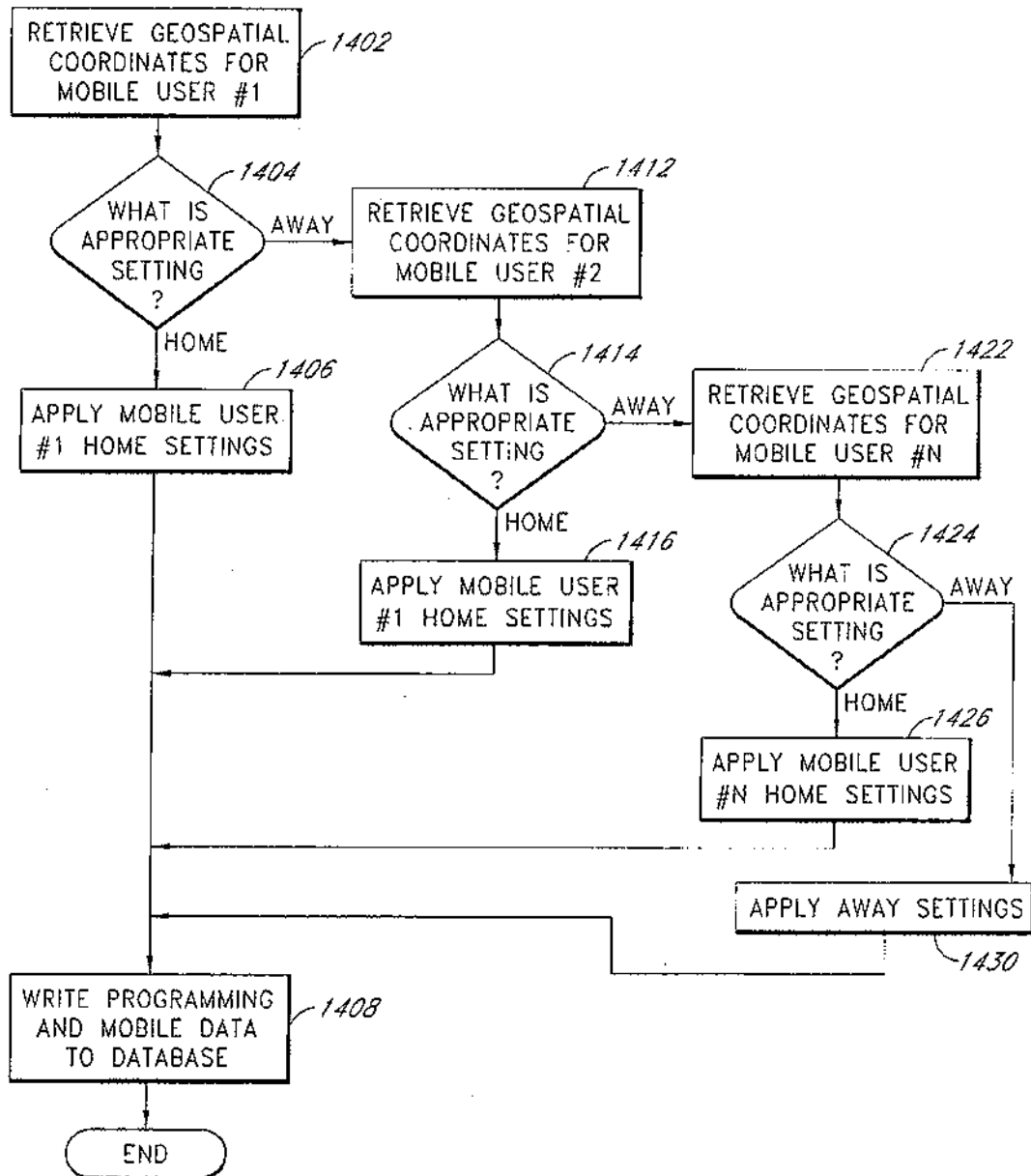


FIG. 9

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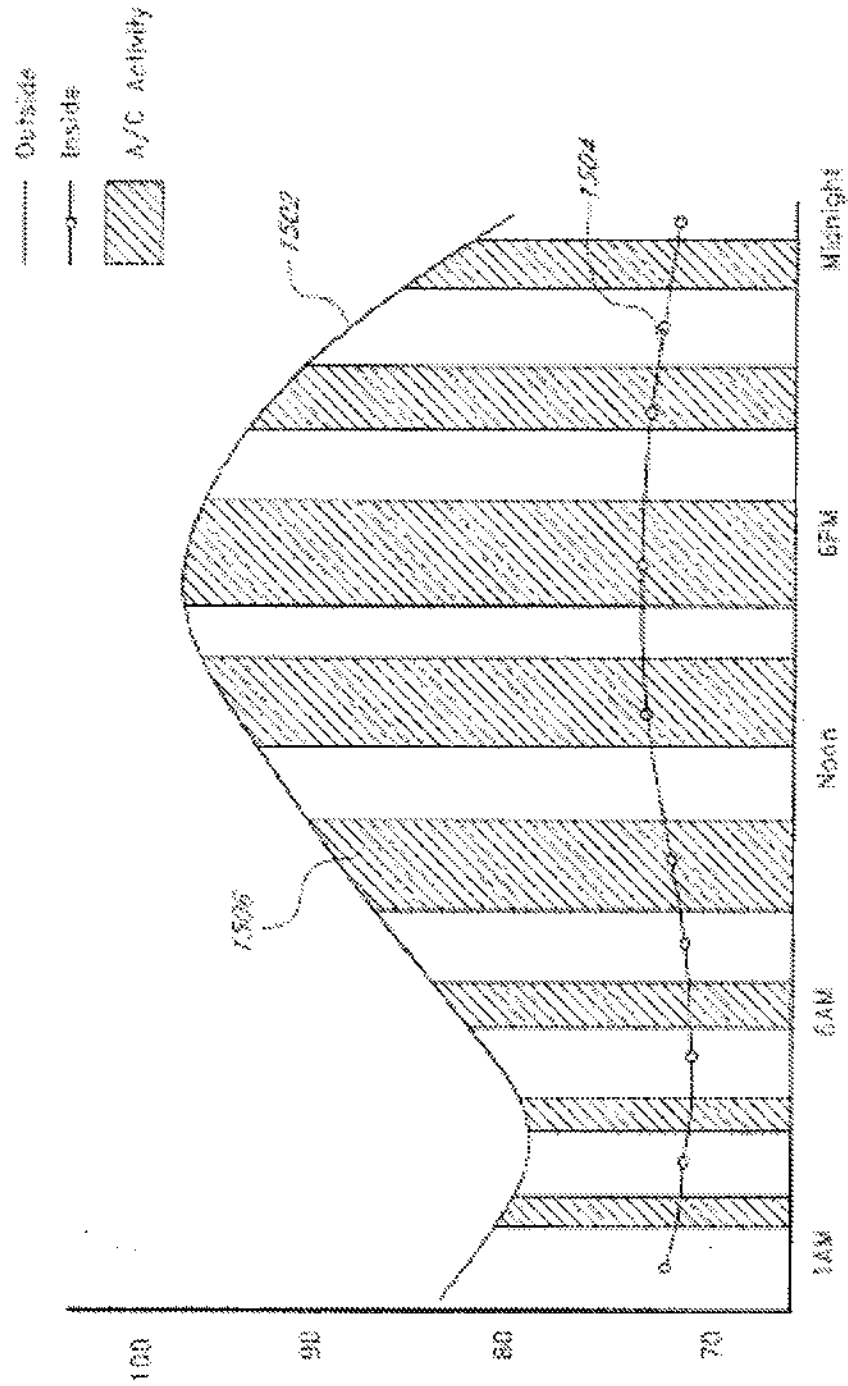


FIG. 10A

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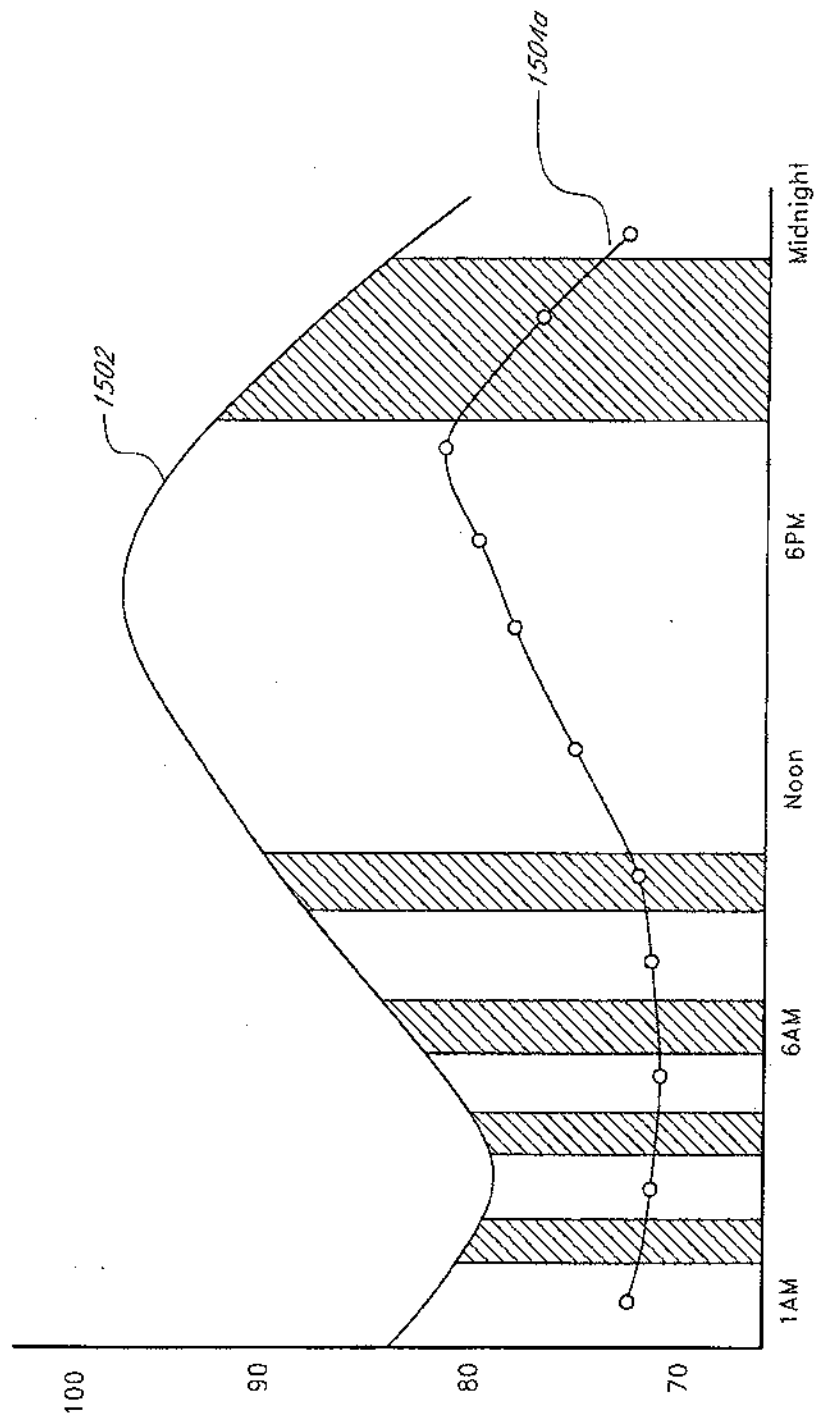


FIG. 10B

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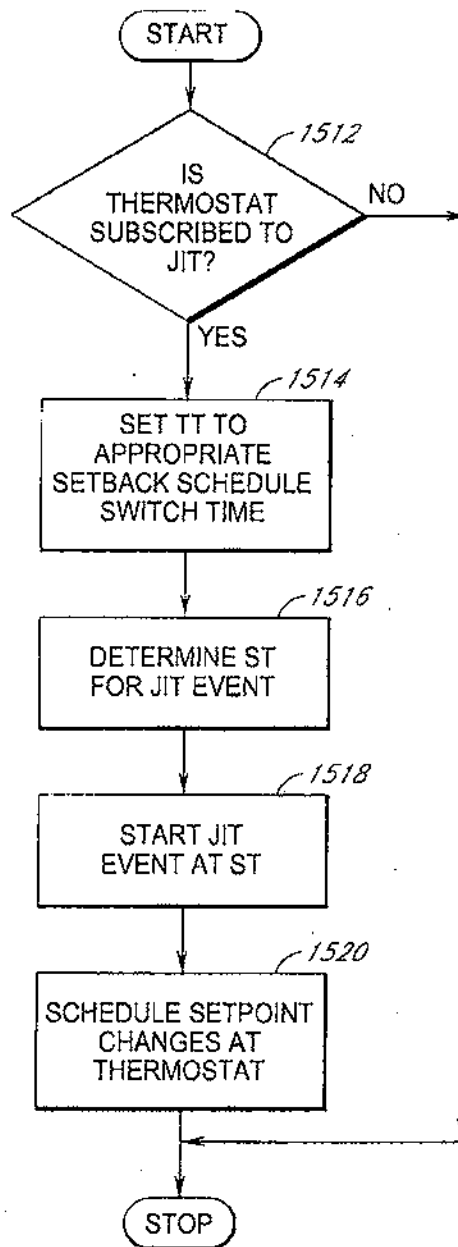
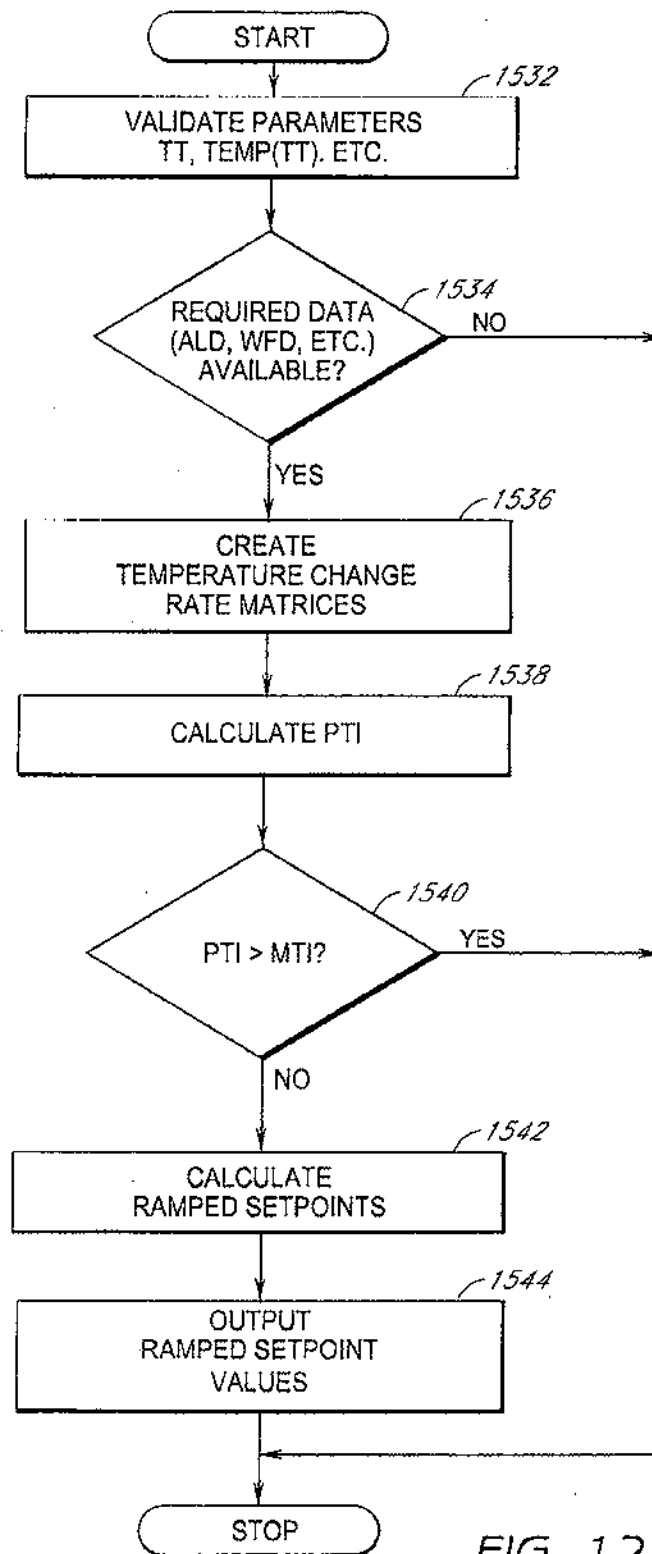


FIG. 11

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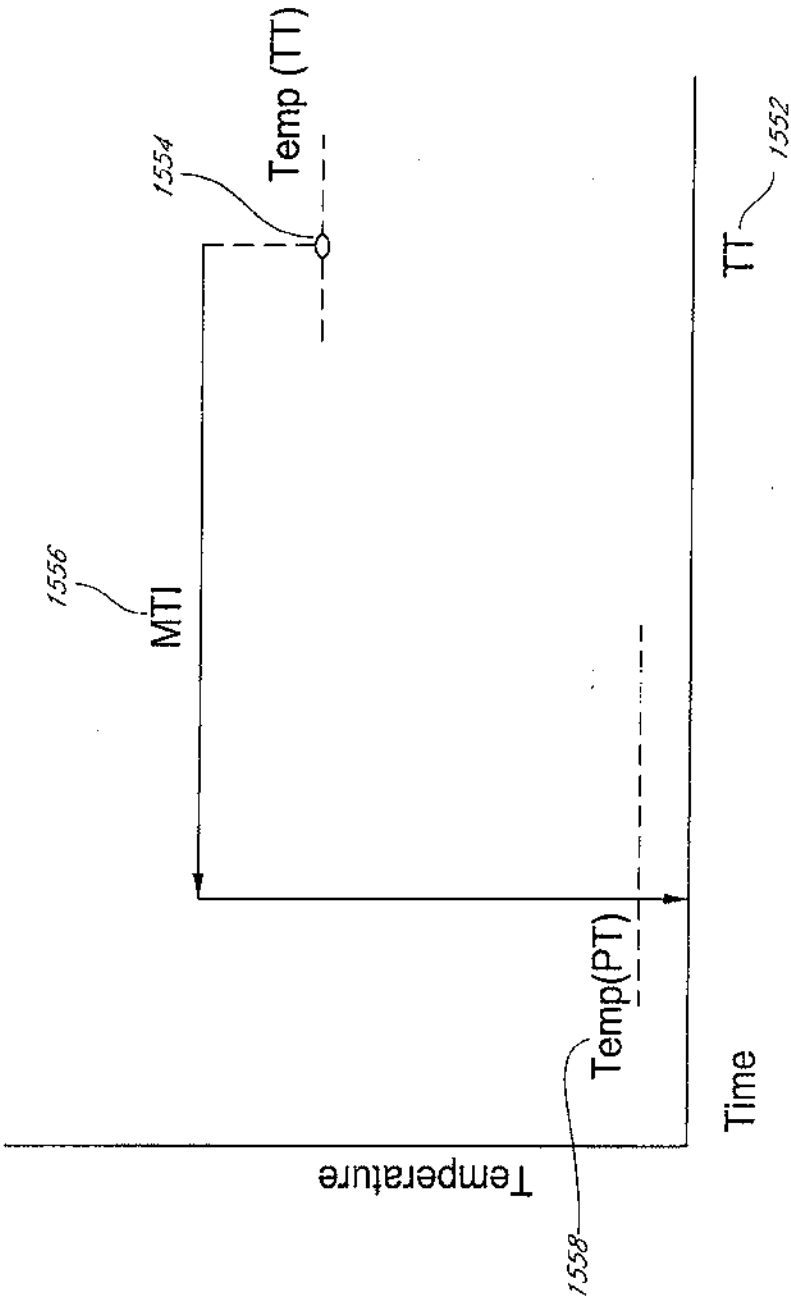


FIG. 13A

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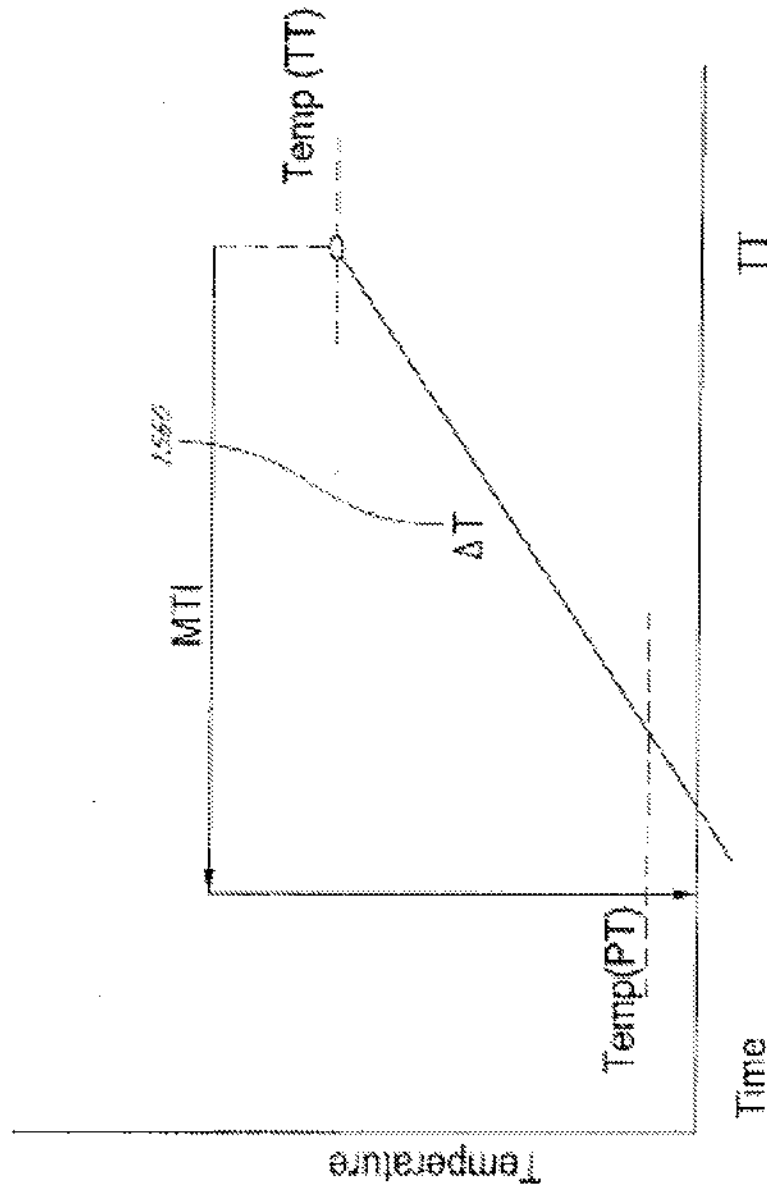


FIG. 13B

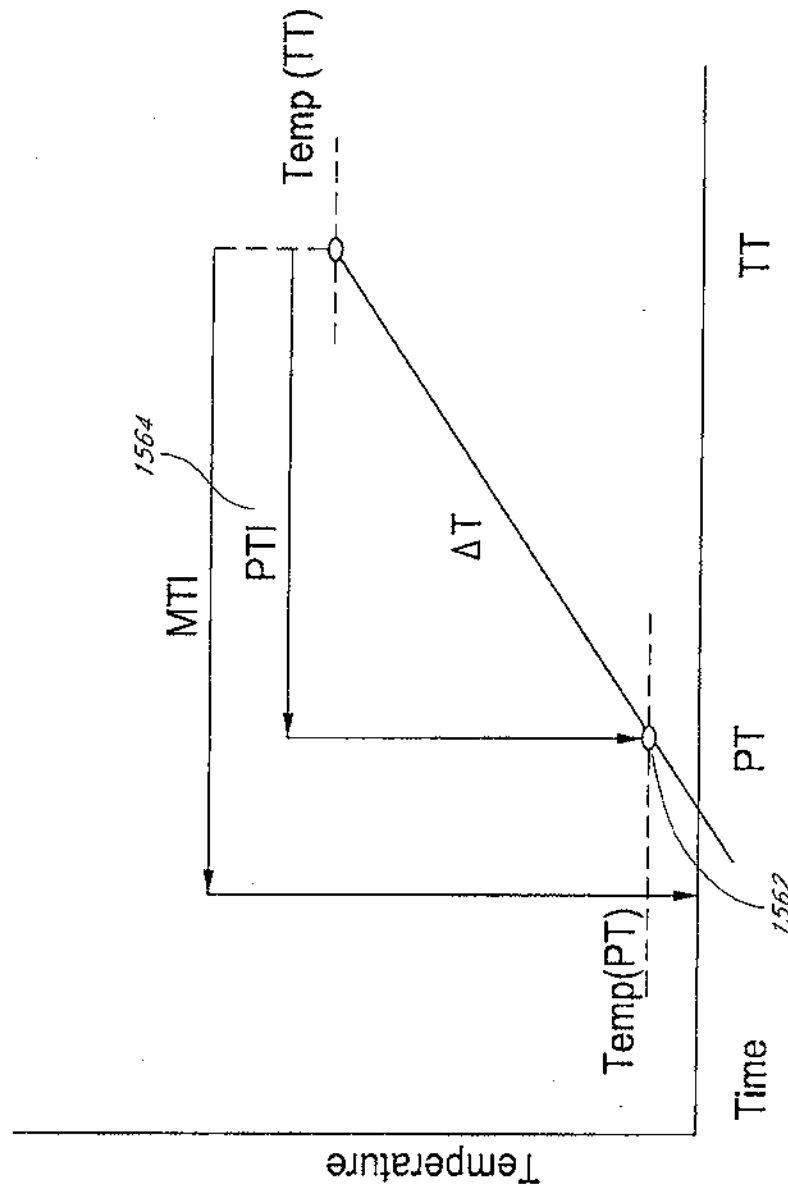


FIG. 13C

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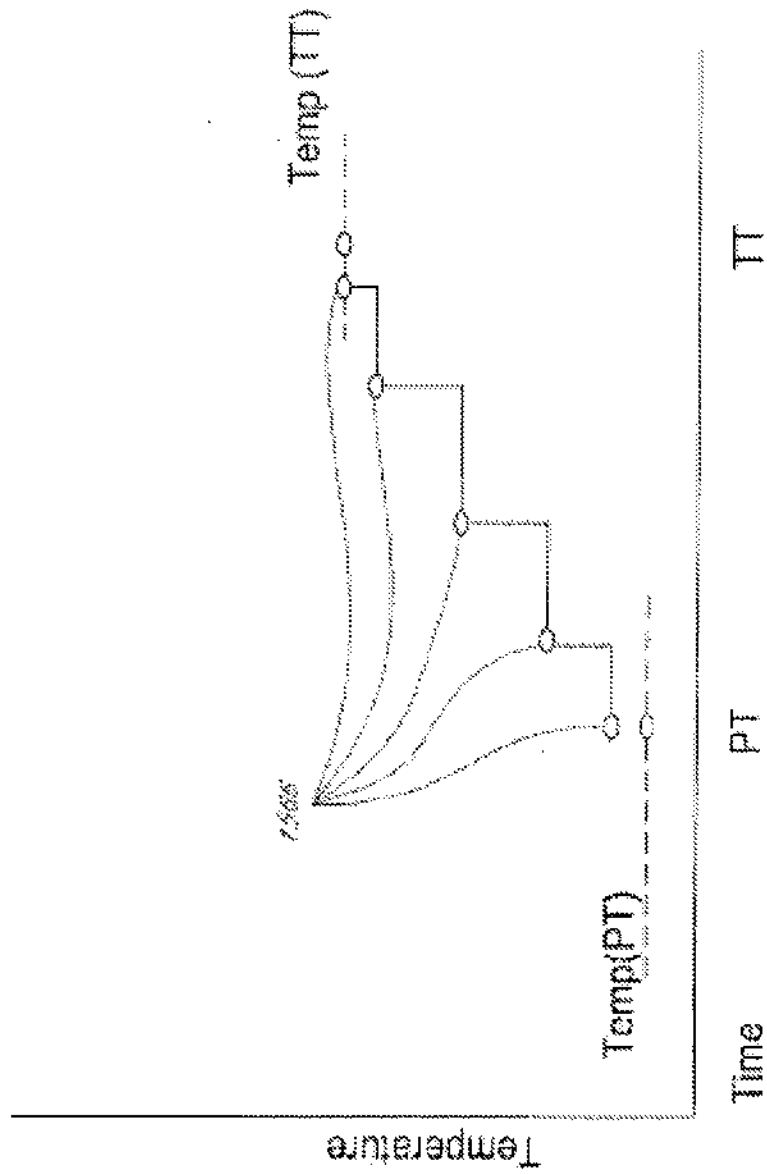


FIG. 13D

FIG. 14

Time	Temperature		Outside Conditions					Inside Conditions							
	Inside Temp.	Outside Temp.	Conditions	Humidity	Pressure	Wind Speed	Wind Direction	Cool Setting	Heat Setting	Hold Mode	Schd Setting	Schd Cool	Schd Heat	Heat Shade	Heat Mode
2009/04/10 11:00	68.70	54.00	Mostly Cloudy	74%	29.85in 1012.1hPa Steady	1.0mph 1.6kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:01	68.60	54.10	Overcast	74%	29.85in 1012.1hPa Rising	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:02	68.60	54.10	Overcast	74%	29.85in 1012.1hPa Steady	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:03	68.70	54.10	Overcast	74%	29.85in 1012.1hPa Rising	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:04	68.70	54.10	Overcast	74%	29.85in 1012.1hPa Steady	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:05	68.70	54.10	Overcast	74%	29.85in 1012.1hPa Rising	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:06	68.80	54.70	Overcast	72%	29.85in 1012.1hPa Steady	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:07	69.00	54.70	Overcast	72%	29.85in 1012.1hPa Rising	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:08	70.00	54.70	Overcast	72%	29.85in 1012.1hPa Steady	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:09	70.00	54.70	Overcast	72%	29.85in 1012.1hPa Rising	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat
2009/04/10 11:10	70.00	54.70	Overcast	72%	29.85in 1012.1hPa Steady	2.0mph 3.2kph	SE	80.00	71.00	Off	OutDay	80.00	65.00	Heat	Heat

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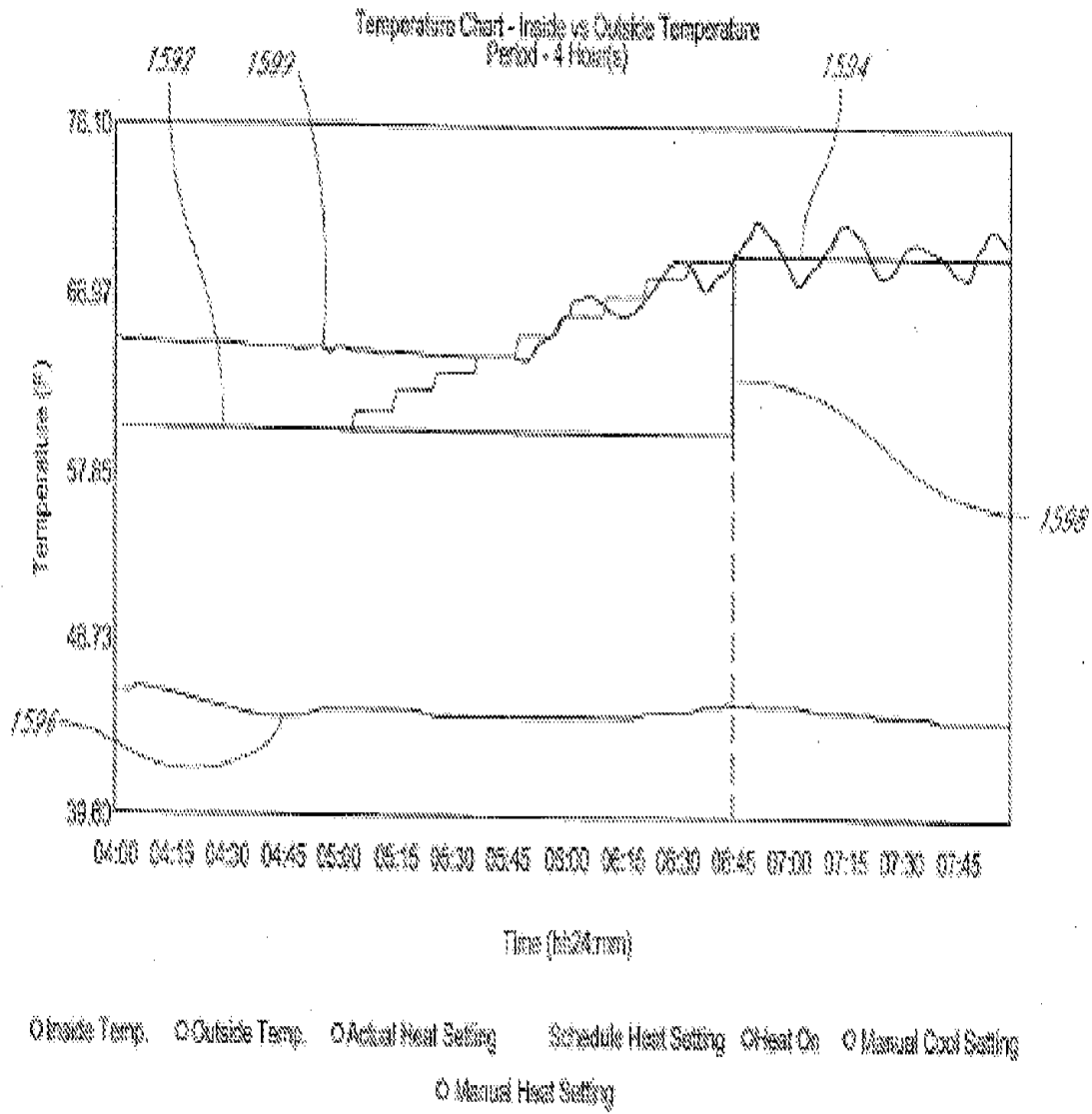


FIG. 15

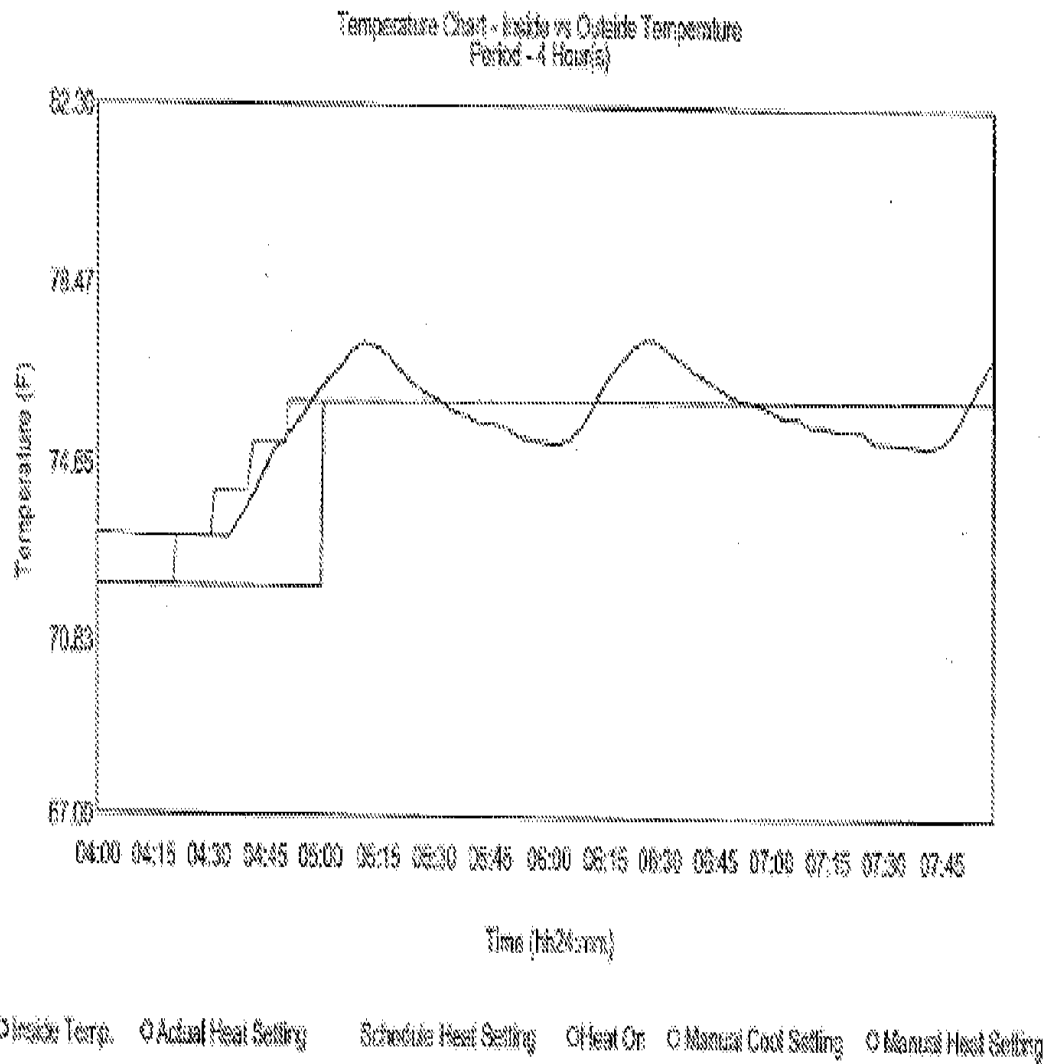


FIG. 16

FIG. 17-1

FIG. 17-2

FIG. 17

1602

1604

FIG. 17-1

Outside/Inside Difference, Degrees F	Predicted Inside Temp Change, Degrees F/hour	Outside/Inside Difference, Degrees F	Predicted Inside Temp Change, Degrees F/hour	Outside/Inside Difference, Degrees F	Predicted Inside Temp Change, Degrees F/hour	Outside/Inside Difference, Degrees F	Predicted Inside Temp Change, Degrees F/hour
-36	-1.2294925	-40	0.8135345	8	2.4656310	61	4.2661771
-38	-1.1728407	-42	0.8331449	9	2.47302394	62	4.2601326
-40	-1.1353389	-44	0.8564711	10	2.4894812	63	4.2608053
-42	-1.0981731	-46	0.7760020	11	2.5459443	64	4.2682351
-44	-1.0630193	-48	0.7322867	12	2.5624046	65	4.4054134
-46	-1.0271535	-50	0.7350000	13	2.6193466	66	4.4181367
-48	-0.9900817	-52	0.8223460	14	2.6532464	67	4.4713365
-50	-0.9547324	-54	0.8371800	15	2.6917830	68	4.5147943
-52	-0.9177281	-56	0.8352362	16	2.7282432	69	4.5525421
-54	-0.8813123	-58	0.9115433	17	2.7647938	70	4.5877459
-56	-0.8448524	-60	0.9751655	18	2.8011839	71	4.6247827
-58	-0.8083027	-62	1.0146372	19	2.8378254	72	4.6685677
-60	-0.7718020	-64	1.0516780	20	2.8748802	73	4.6870000
-62	-0.7354191	-66	1.0540001	21	2.9105401	74	4.7100011
-64	-0.6990117	-68	1.1200072	22	2.9479028	75	4.7101320
-66	-0.6625810	-70	1.1604830	23	2.9854646	76	4.8001543
-68	-0.6260917	-72	1.1992154	24	3.0192664	77	4.8200000
-70	-0.5896119	-74	1.2323782	25	3.0530002	78	4.8700000
-72	-0.5531710	-76	1.2600000	26	3.0823171	79	4.9100000
-74	-0.5167103	-78	1.3024618	27	3.1230000	80	4.9521000
-76	-0.4802500	-80	1.3475000	28	3.1637000	81	4.9877000
-78	-0.4437907	-82	1.3922000	29	3.2022171	82	5.0252000

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FIG. 17-1 (continued)

FIG. 17-2 (continued)

77	0.4773079	-27	1.4787872	2	2.2000772	73	5.0000073
78	0.5702701	-26	1.4821880	2	2.2754794	74	5.0000071
79	0.6334003	-25	1.4865508	2	2.3476009	75	5.0000070
80	0.6759675	-24	1.4908836	2	2.4165007	76	5.0000077
81	0.7074003	-23	1.4951924	2	2.4824005	77	5.0000075
82	0.7285003	-22	1.4994792	2	2.5455003	78	5.0000073
83	0.7390004	-21	1.5037436	2	2.6059001	79	5.0000071
84	0.7397003	-20	1.5079880	3	2.6636000	80	5.0000070
85	0.7304000	-19	1.5122116	3	2.7187001	81	5.0000077
86	0.7117007	-18	1.5164034	3	2.7712000	82	5.0000075
87	0.6847204	-17	1.5205636	3	2.8212000	83	5.0000073
88	0.6503003	-16	1.5146937	3	2.8687001	84	5.0000071
89	0.6091918	-15	1.5087998	3	2.9137000	85	5.0000070
90	0.5620005	-14	1.5028836	3	2.9562002	86	5.0000077
91	0.5091123	-13	1.4969424	3	2.9962002	87	5.0000075
92	0.4507241	-12	1.4909742	3	3.0337003	88	5.0000073
93	0.3870000	-11	1.4849748	3	3.0687001	89	5.0000071
94	0.3240077	-10	1.4789474	4	3.1012000	90	5.0000070
95	0.2600000	-9	1.4728836	4	3.1312001	91	5.0000077
96	0.2041013	-8	1.4667834	4	3.1587000	92	5.0000075
97	0.1570000	-7	1.4606436	4	3.1837001	93	5.0000073
98	0.1180049	-6	1.4544635	4	3.2062000	94	5.0000071
99	0.0847000	-5	1.4482433	4	3.2262001	95	5.0000070
100	0.0570000	-4	1.4419836	4	3.2437000	96	5.0000077
101	0.0347100	-3	1.4356834	4	3.2587001	97	5.0000075
102	0.0174200	-2	1.4293432	4	3.2712000	98	5.0000073
103	0.0000000	-1	1.4229634	4	3.2812001	99	5.0000071
104	0.0000000	0	1.4165436	4	3.2887000	100	5.0000070

FIG. 17-2

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PC-01/05/2013/05/27/26

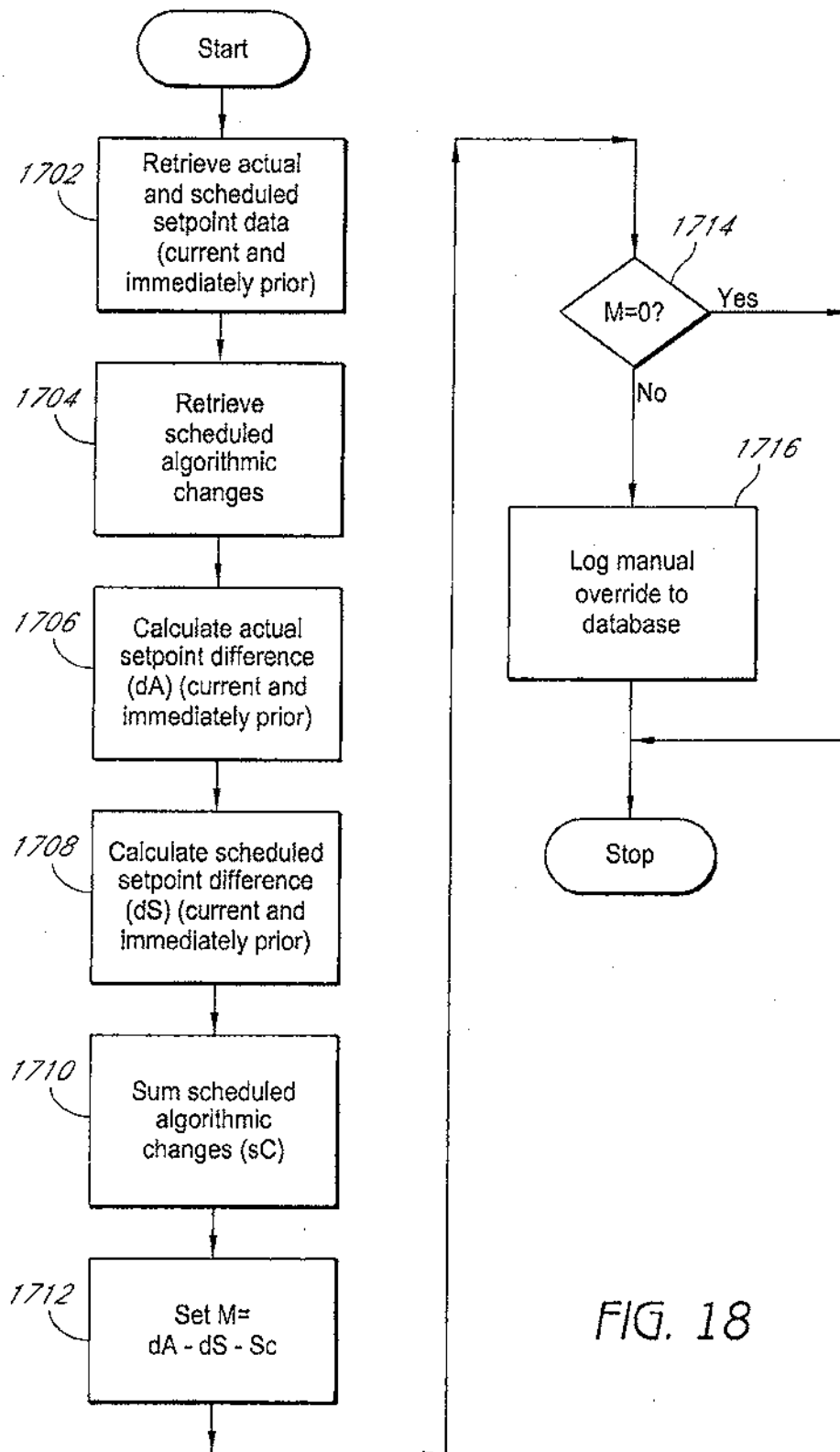


FIG. 18

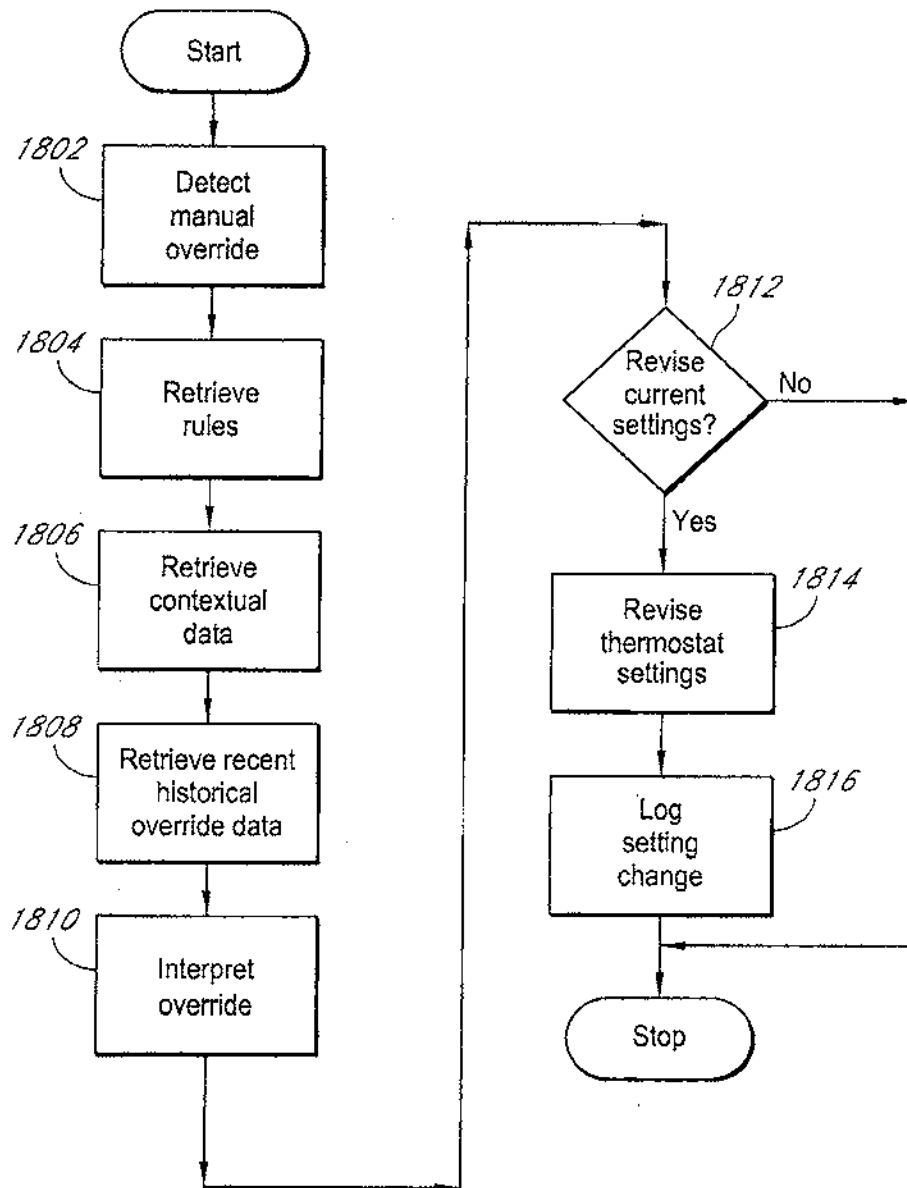


FIG. 19

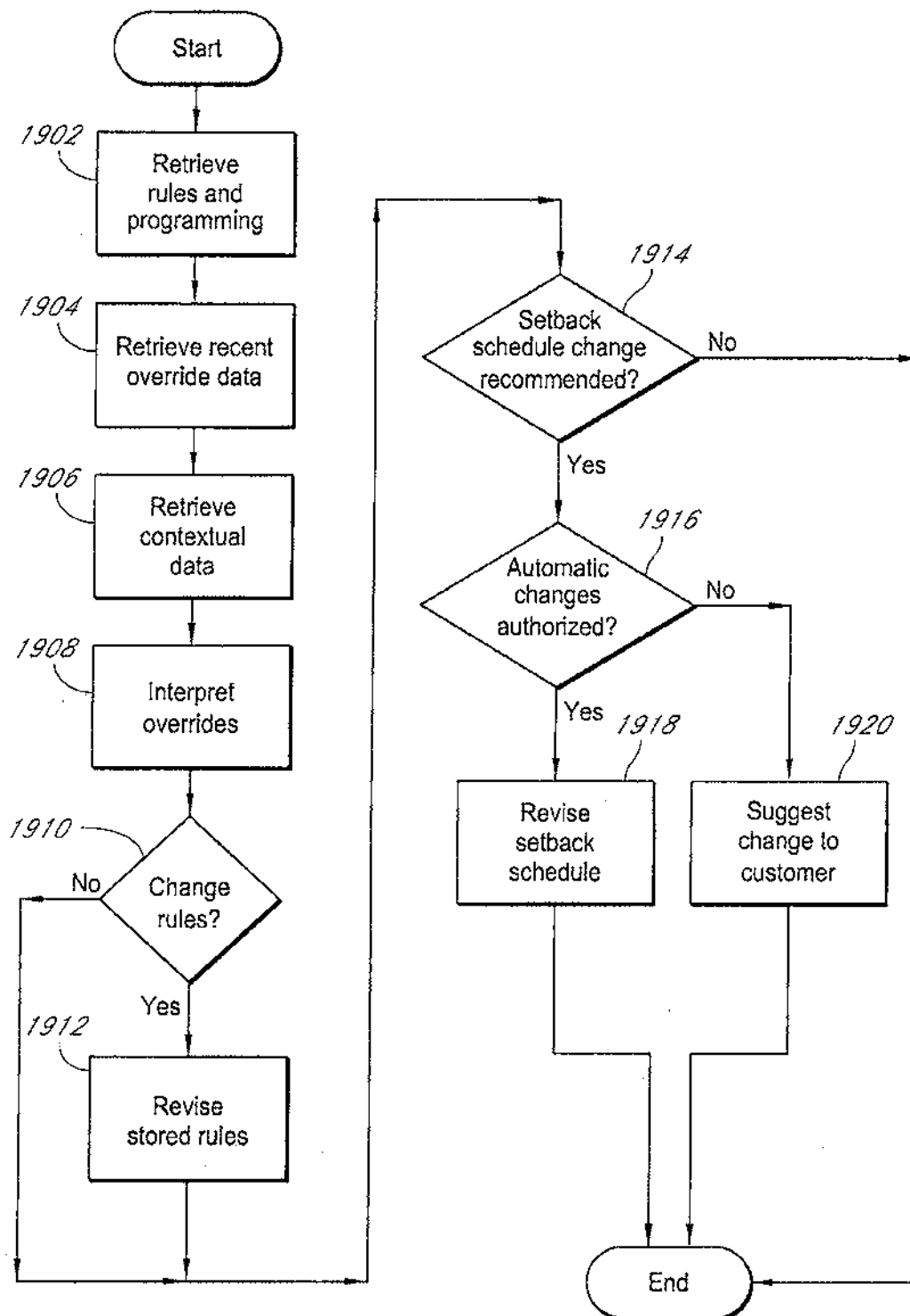


FIG. 20

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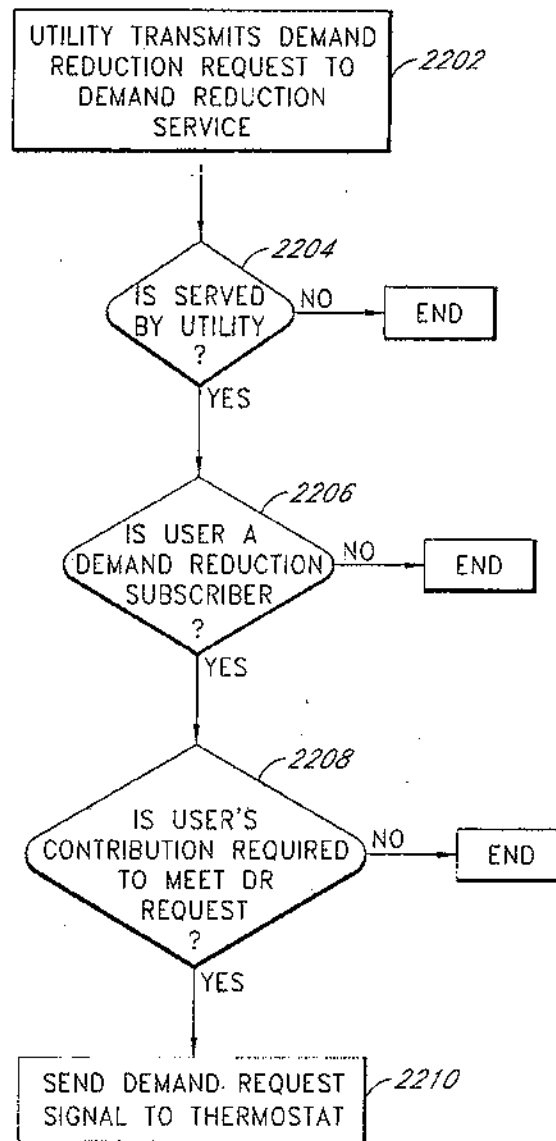


FIG. 21

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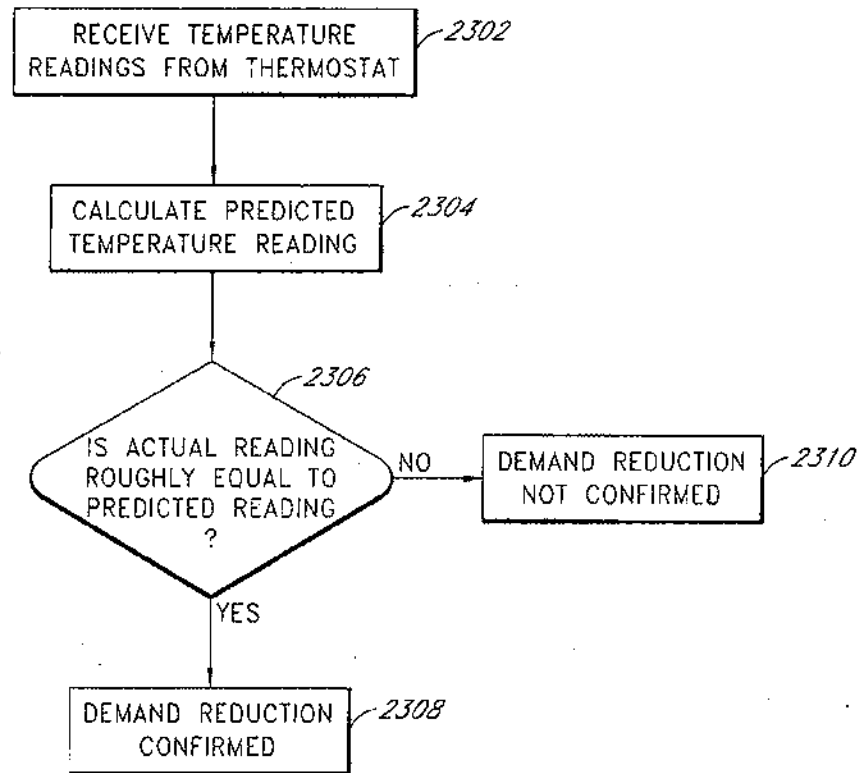


FIG. 22

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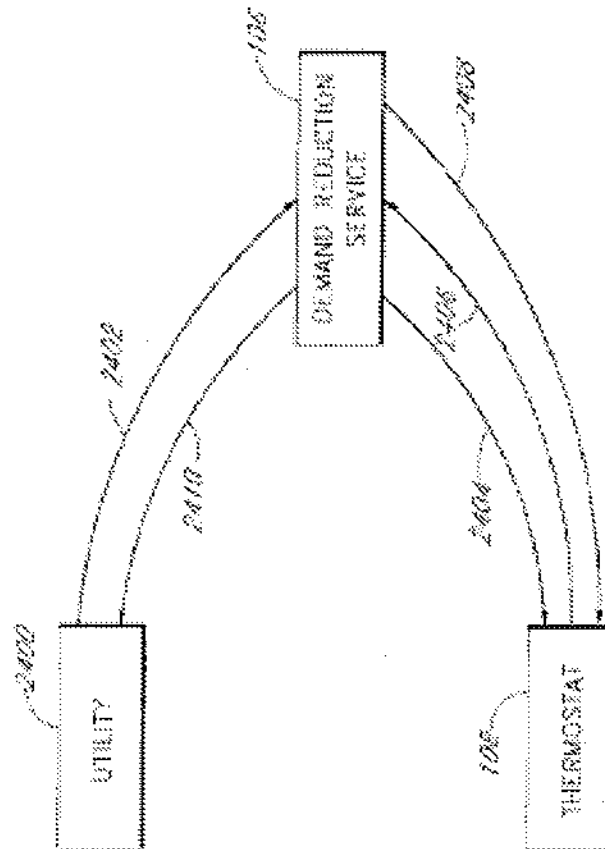


FIG. 23

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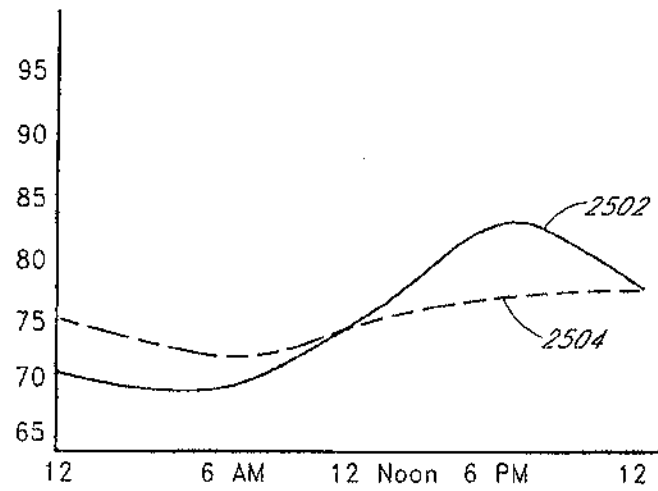


FIG. 24A

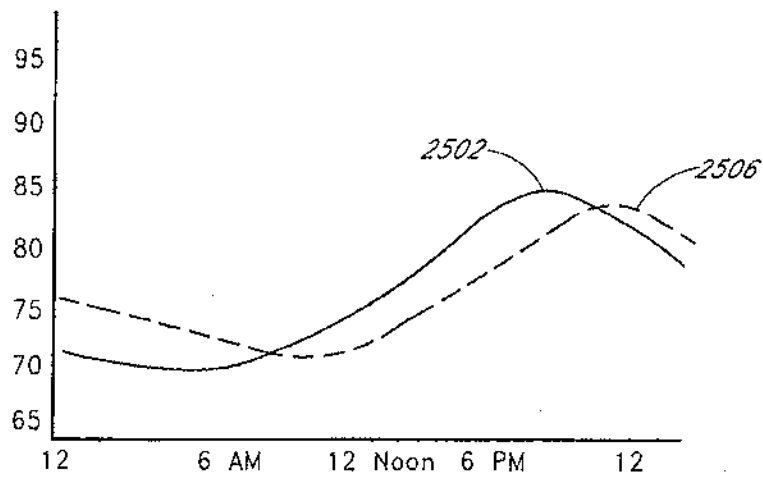


FIG. 24B

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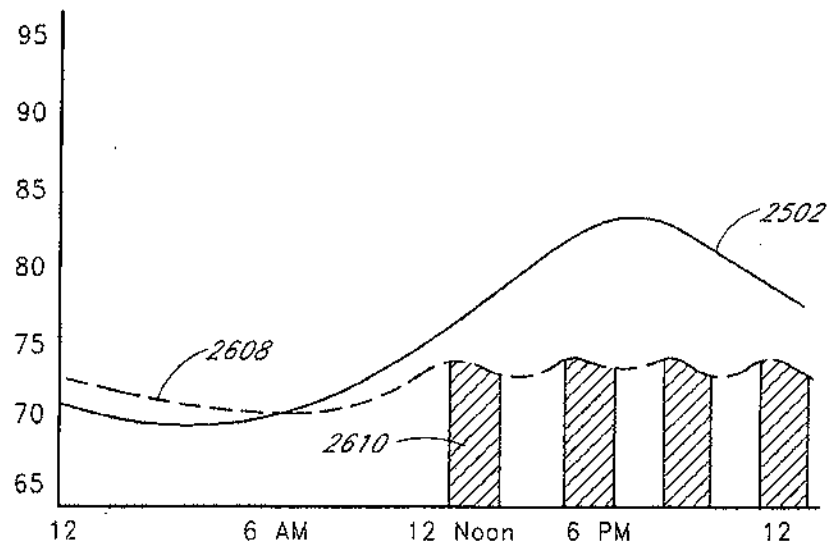


FIG. 25A

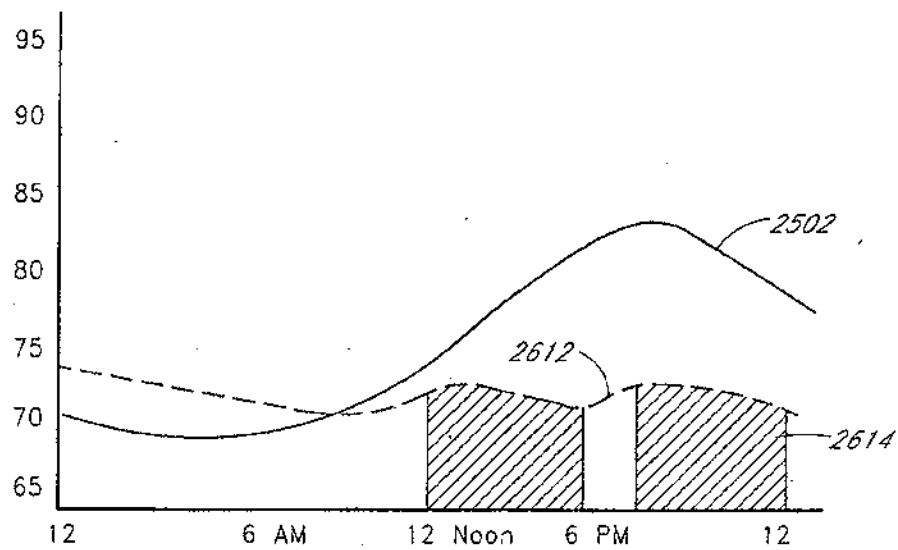


FIG. 25B

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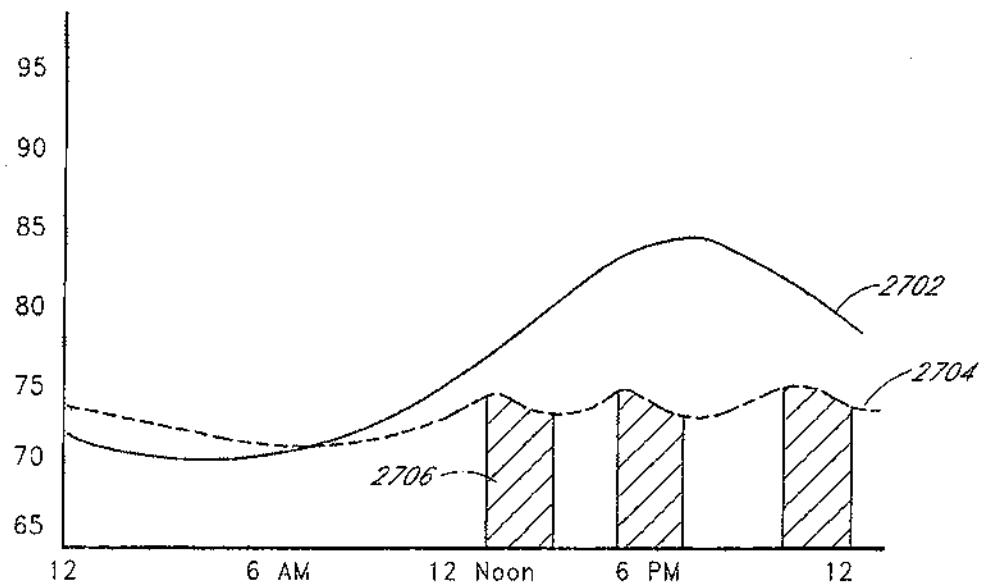


FIG. 26A

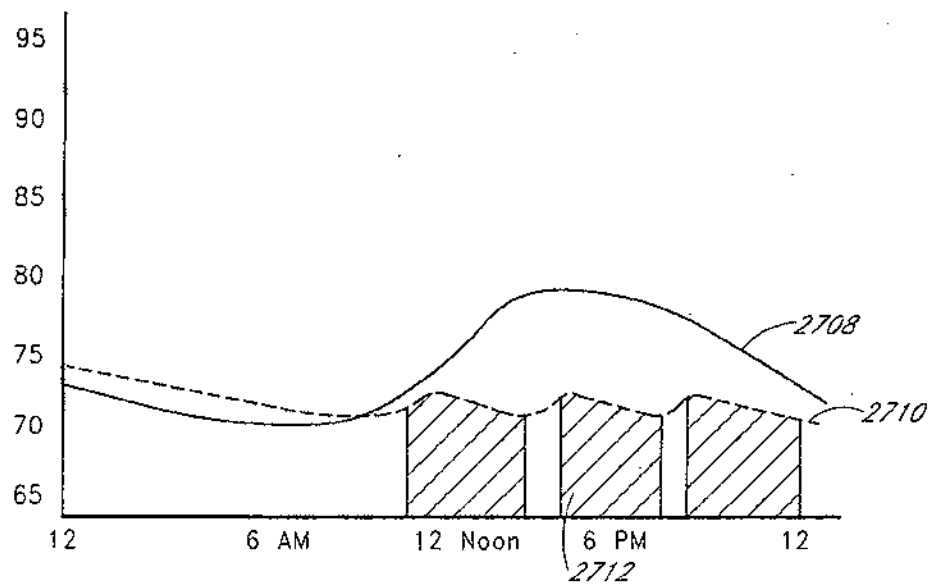


FIG. 26B

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PCT/US2013/035726

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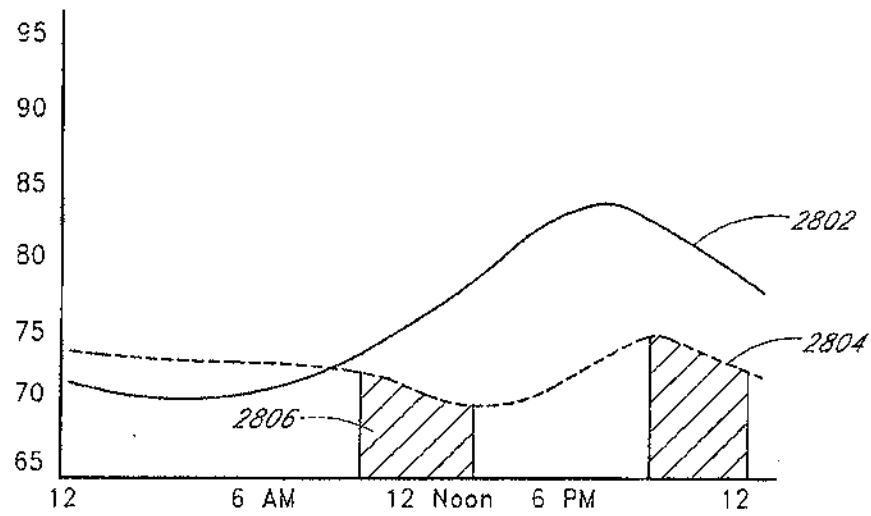


FIG. 27A

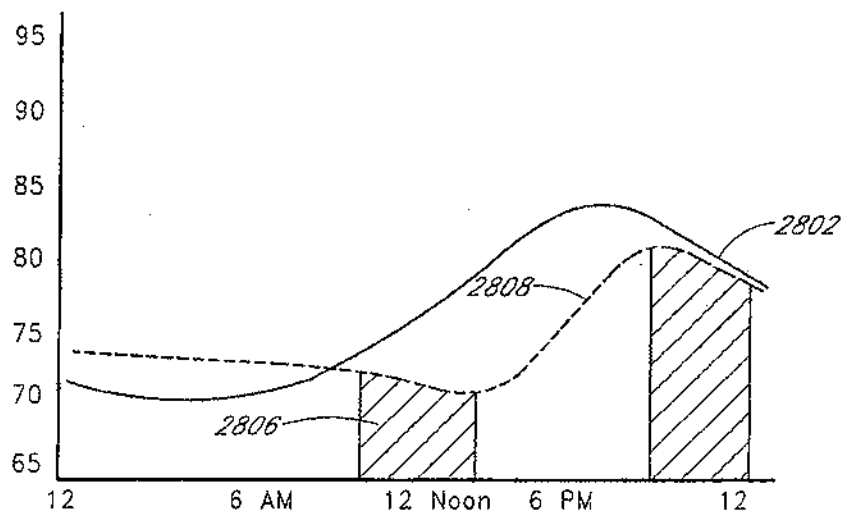


FIG. 27B

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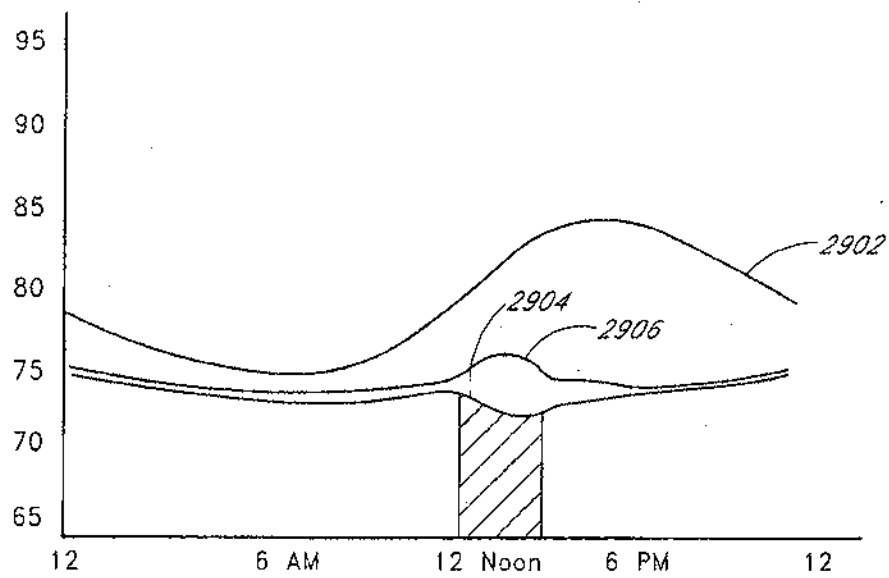


FIG. 28A

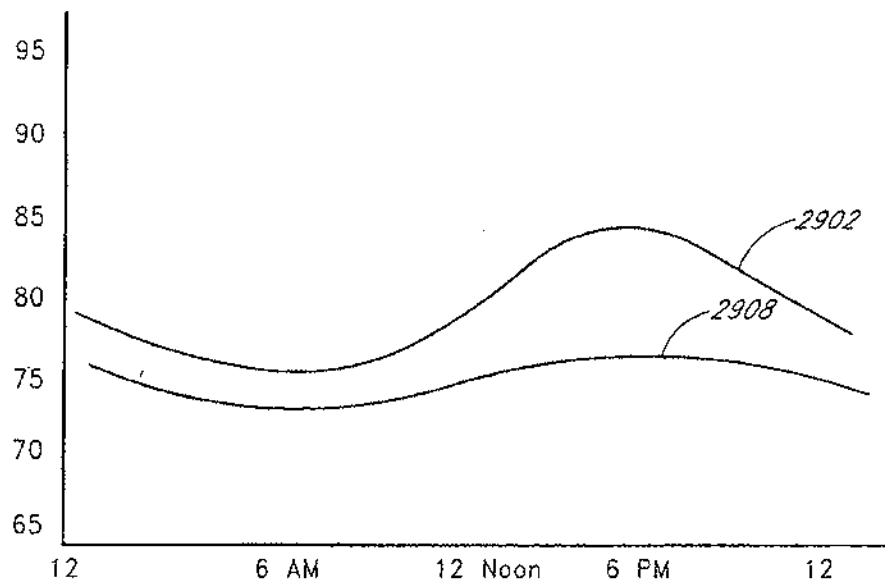


FIG. 28B

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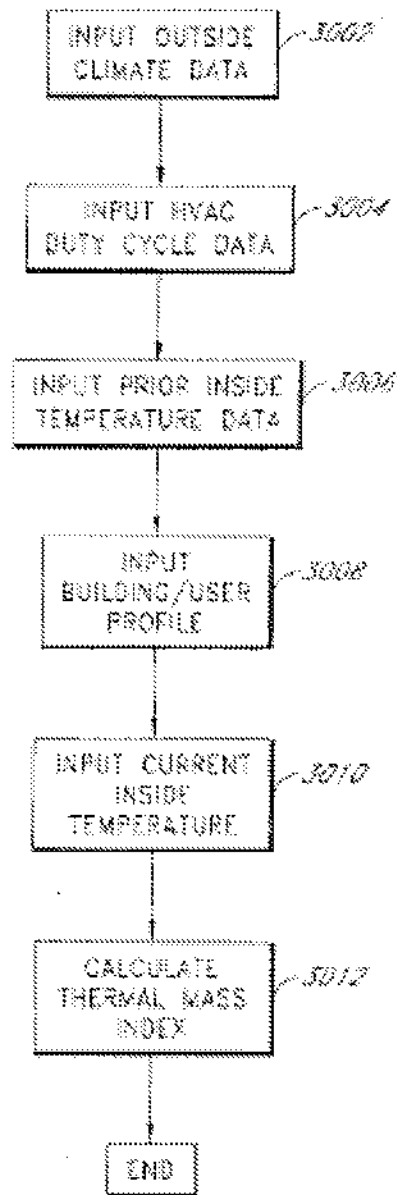


FIG. 29

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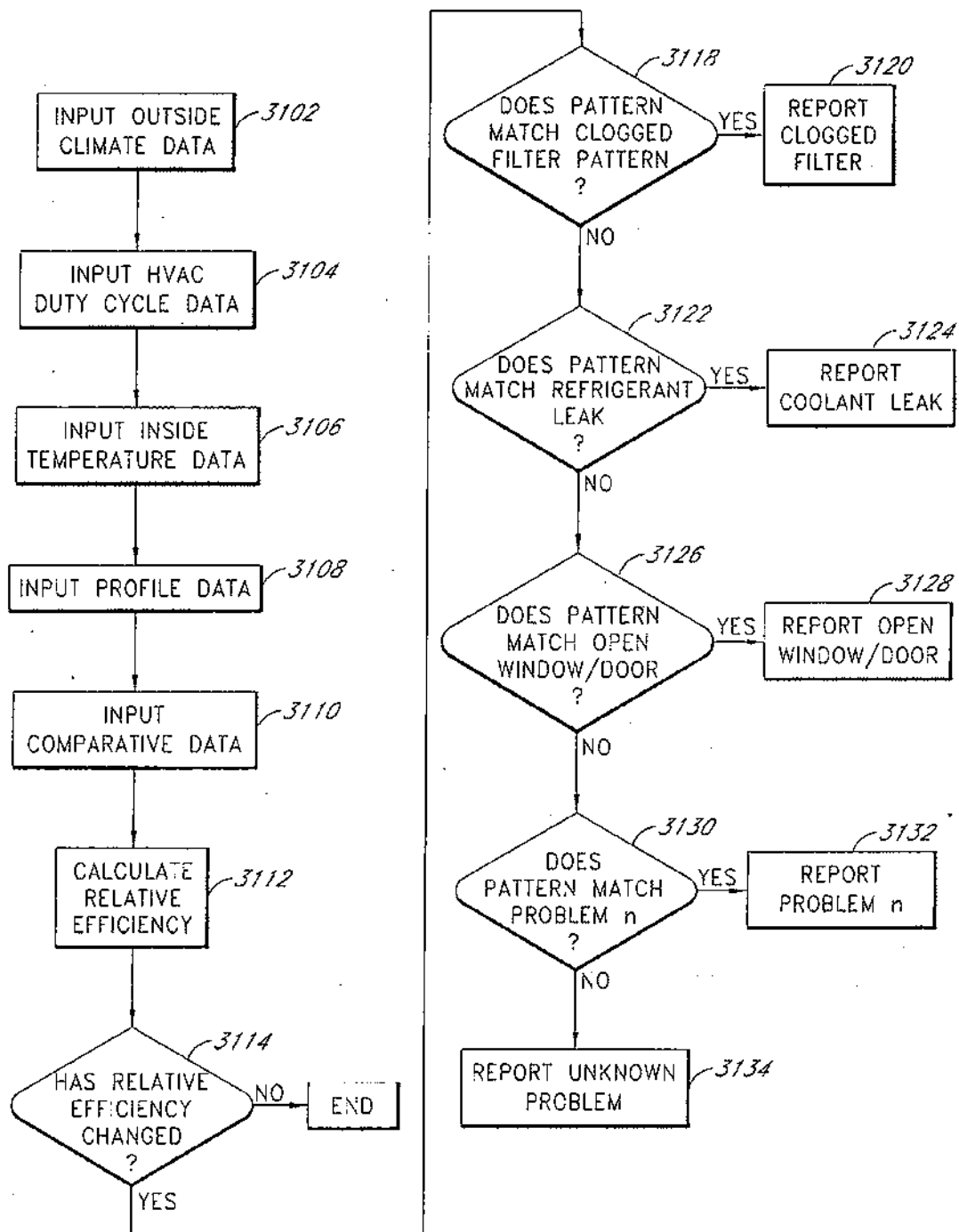


FIG. 30

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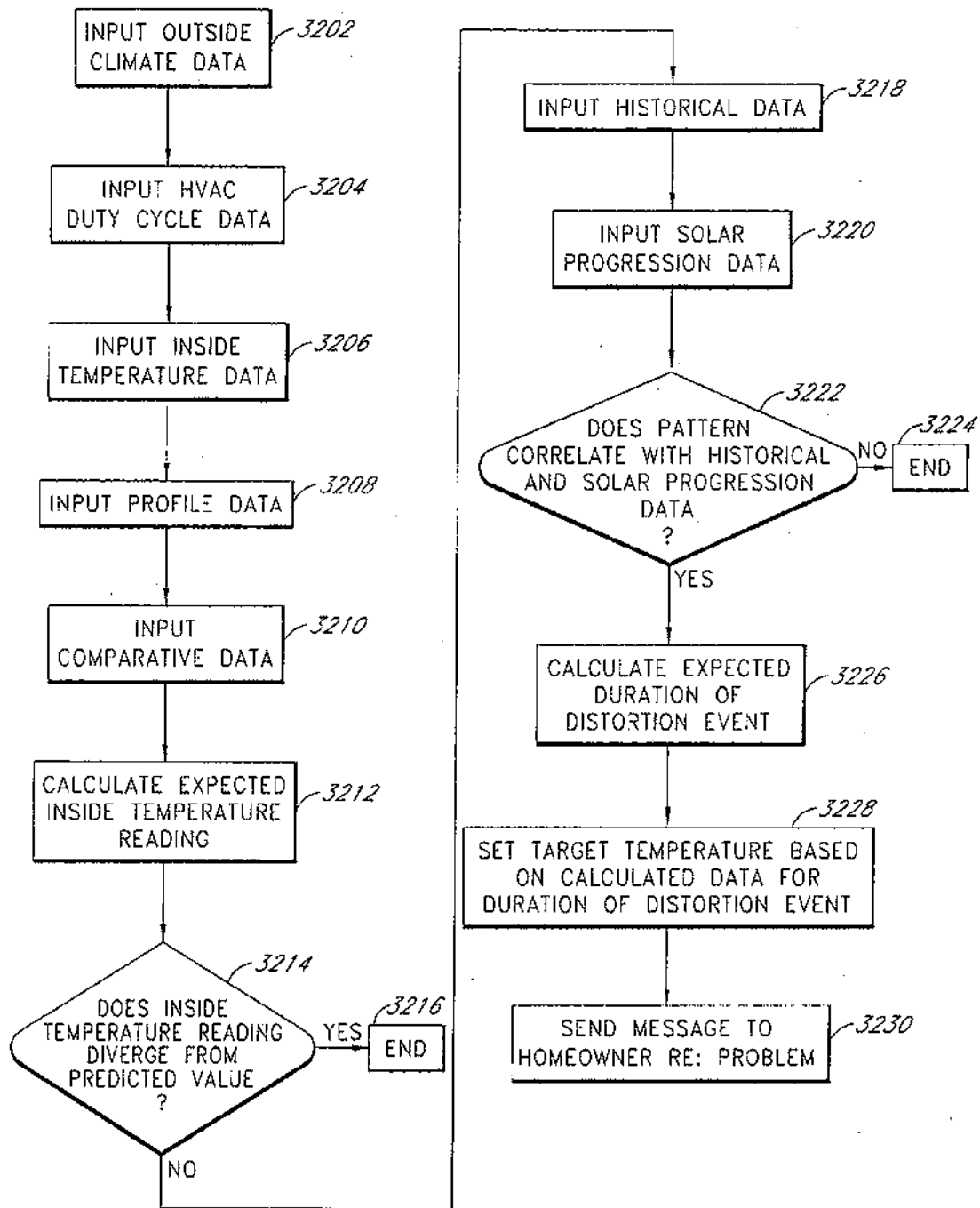
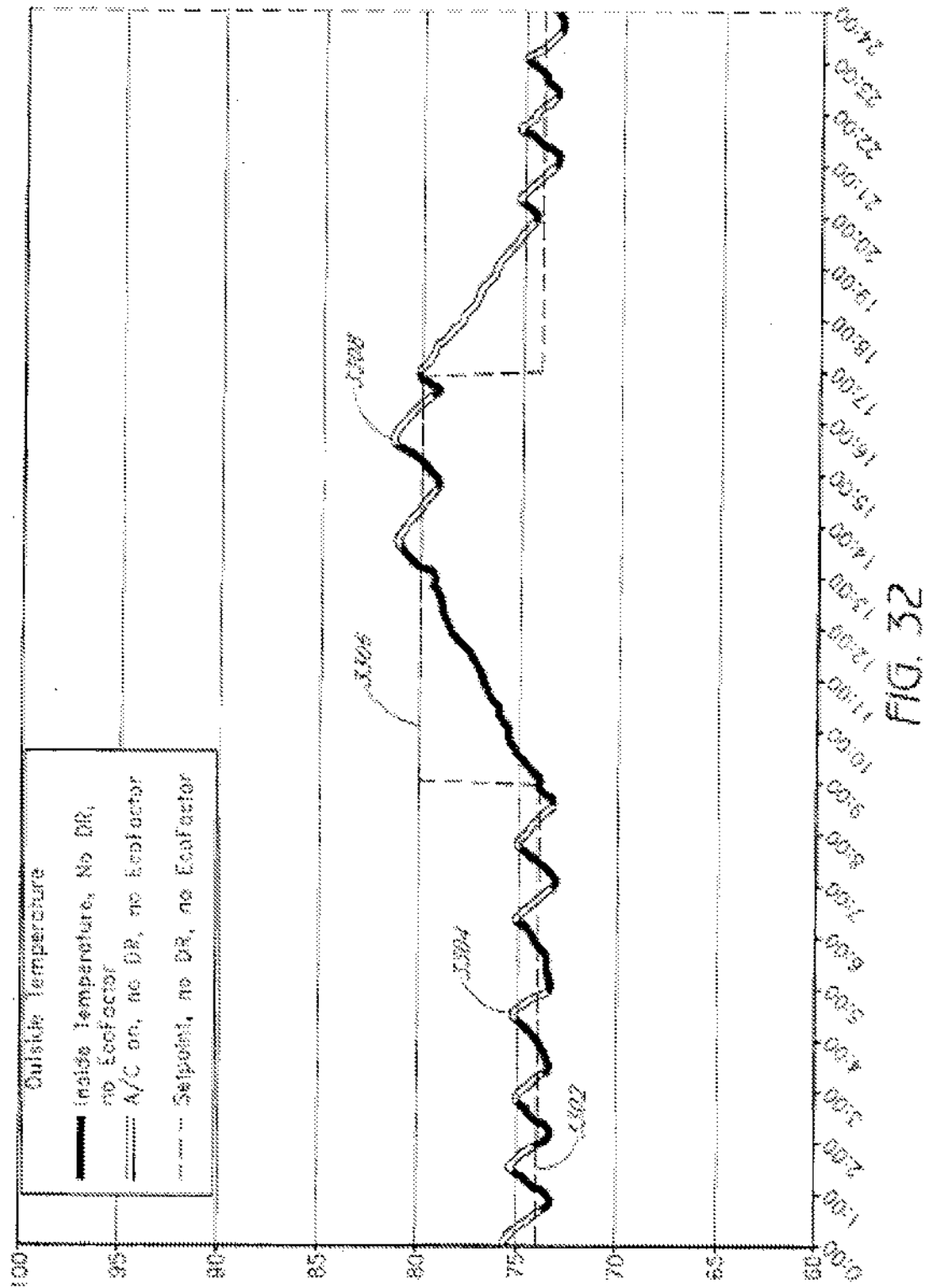


FIG. 31

WD 2013/187996

PCT/US2013/035726

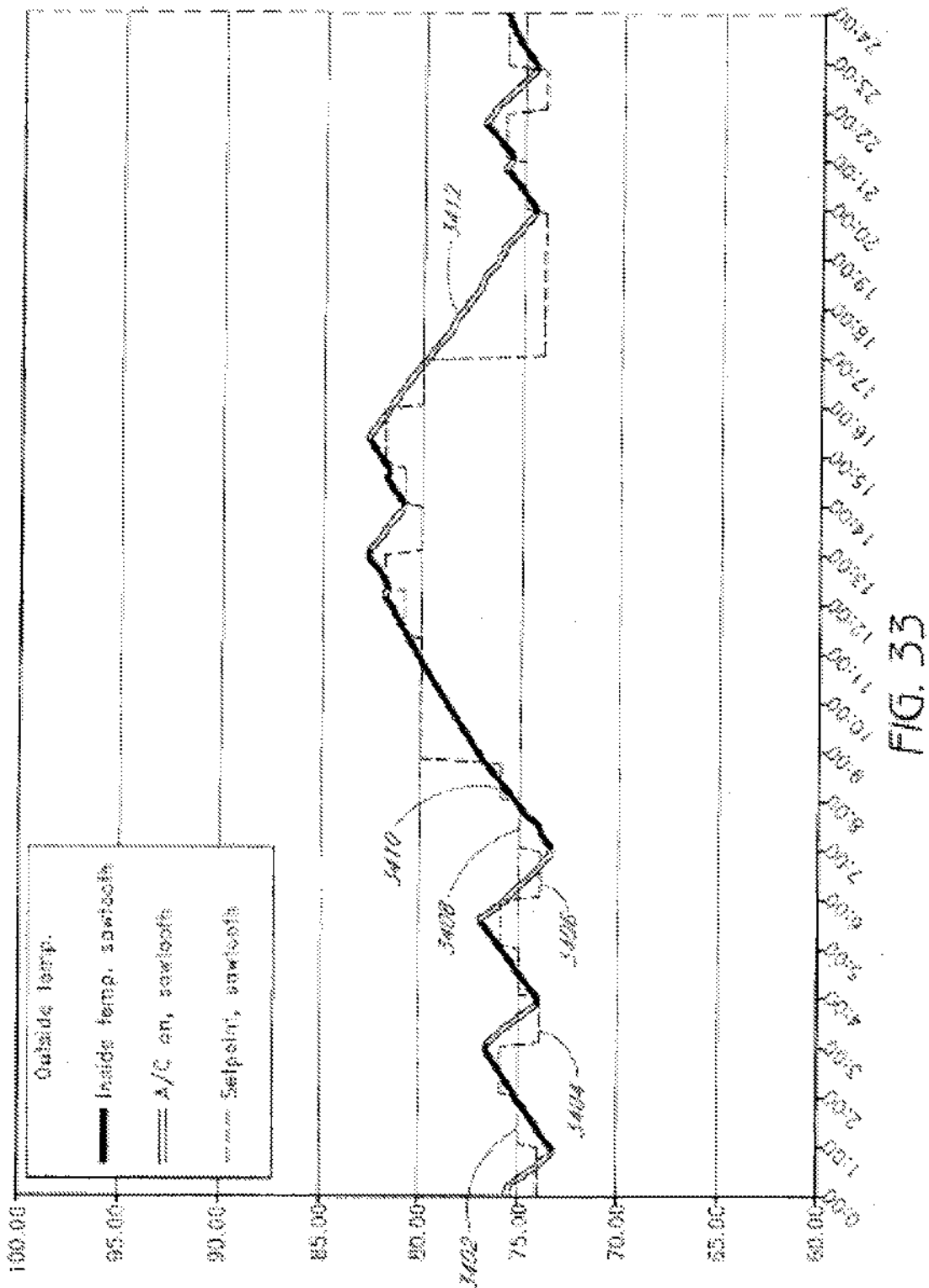
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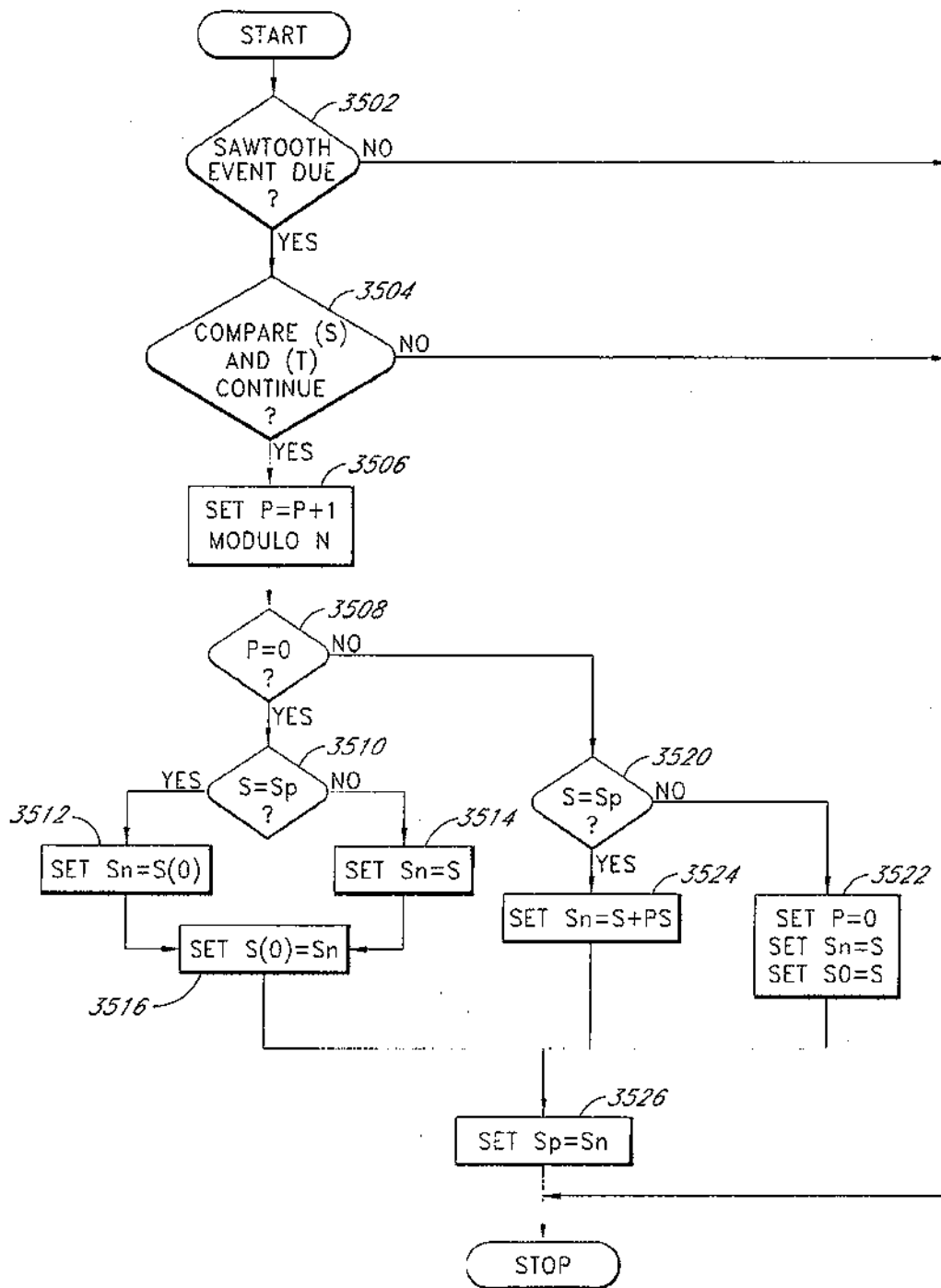


FIG. 34

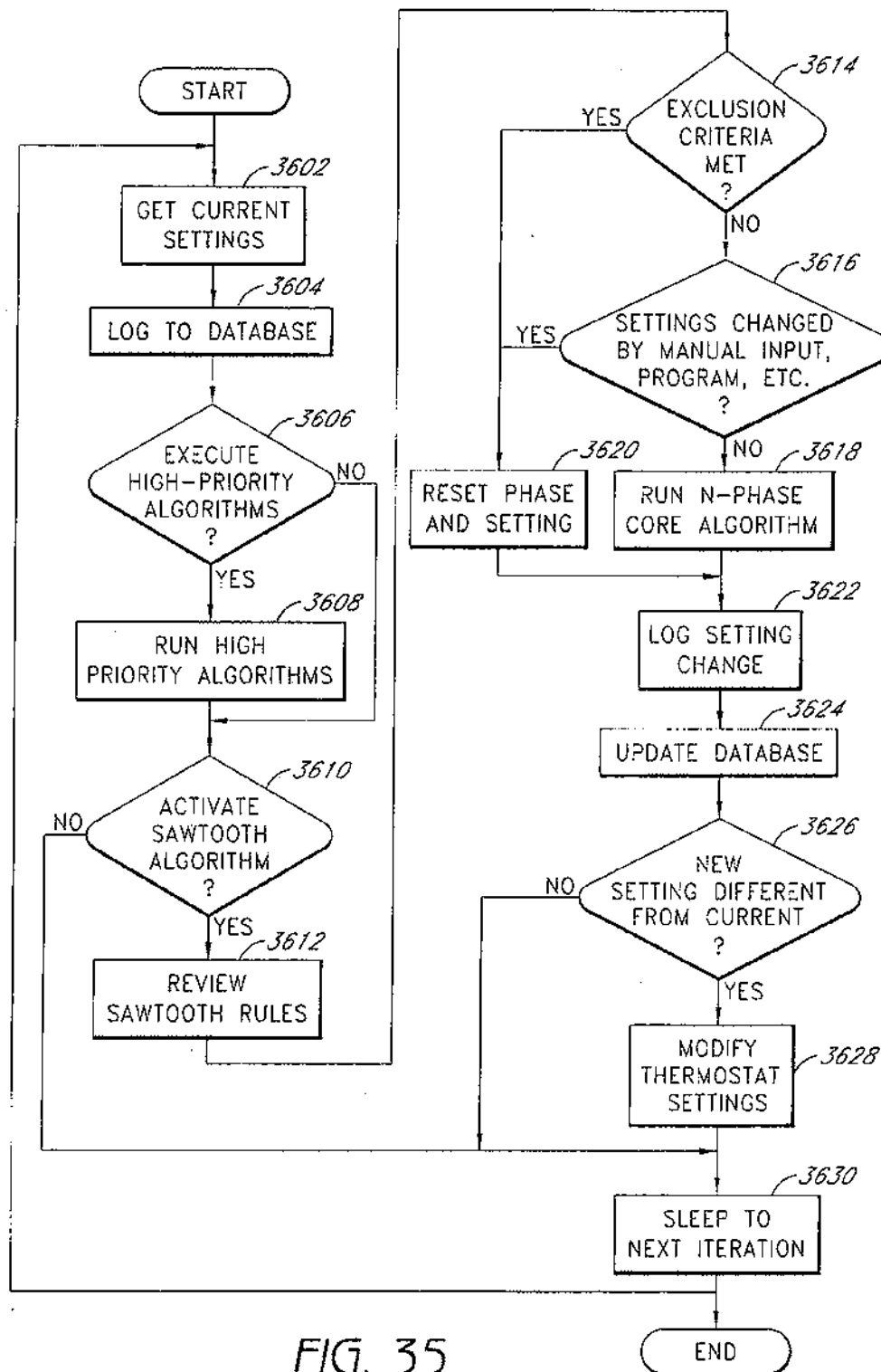


FIG. 35

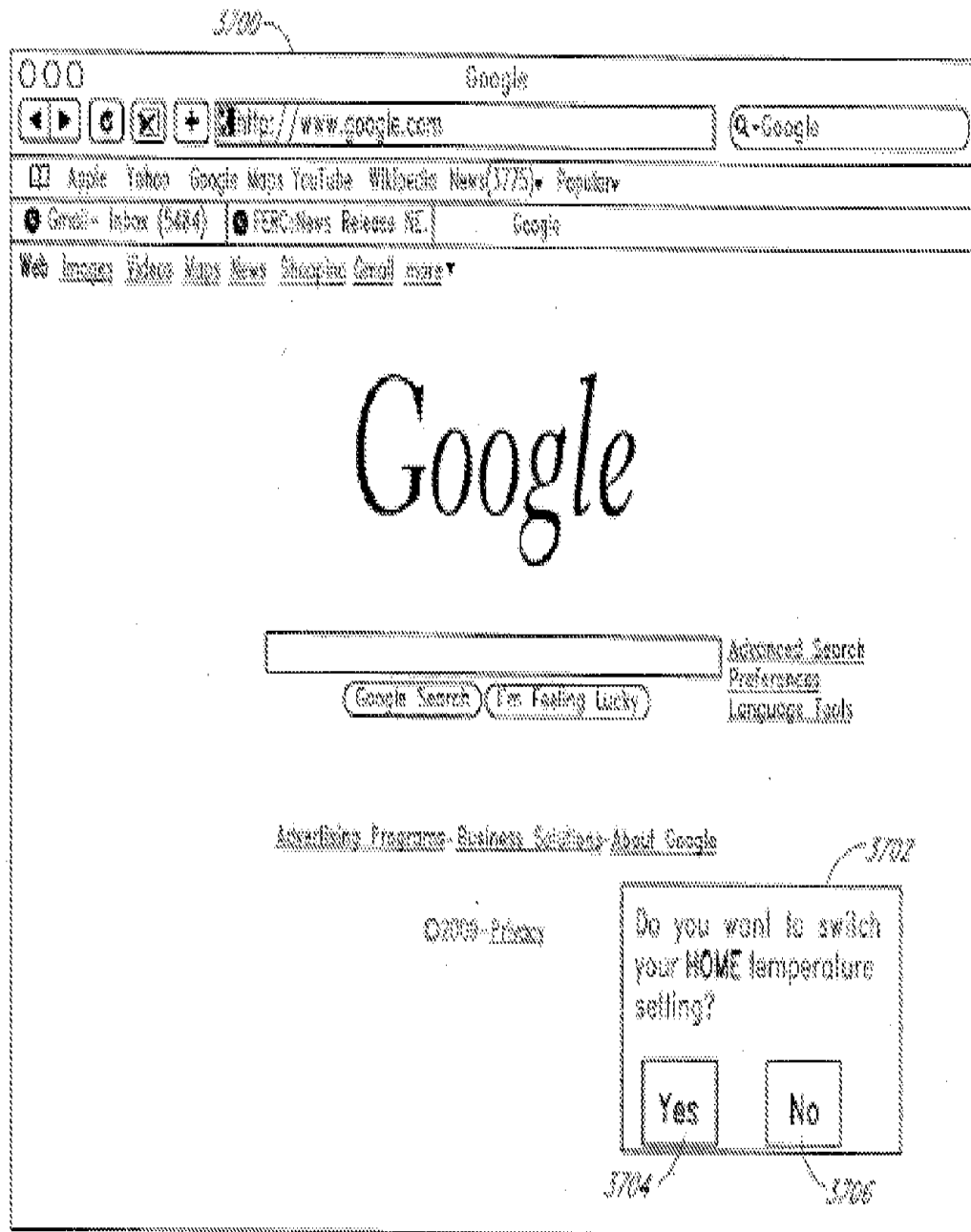


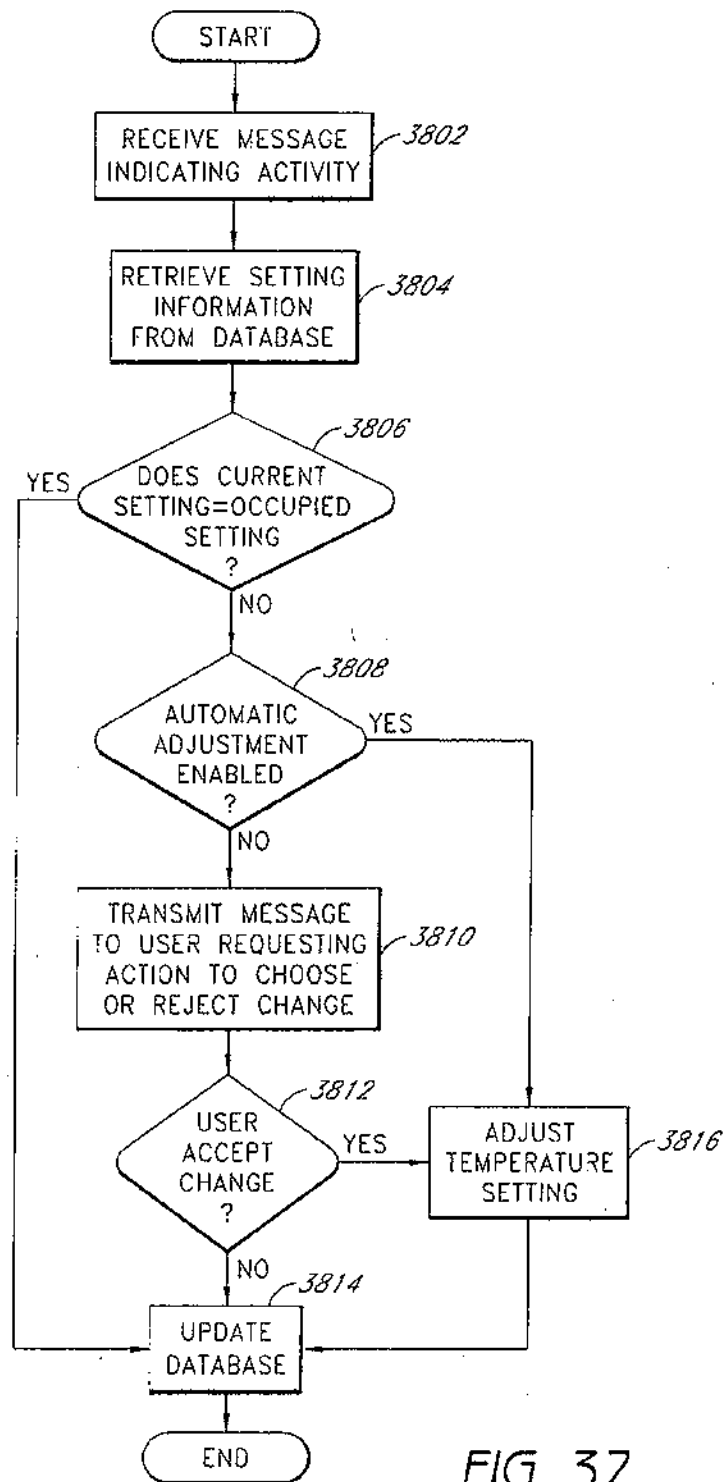
FIG. 36

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IPC 7/00S201A0035726

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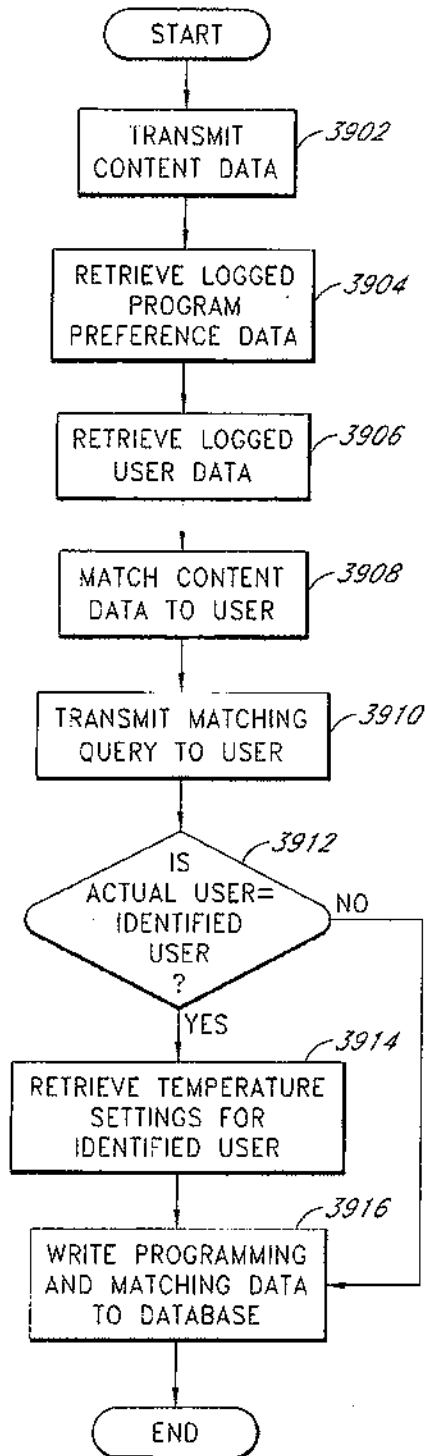


FIG. 38

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/035726

A. CLASSIFICATION OF SUBJECT MATTER

F24F 11/02(2006.01), G05D 23/00(2006.01), G06Q 50/00(2012.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24F 11/02; F24N 1/00; F24F 5/00; G05D 23/00; G06Q 50/00Documentation searched (other than minimum documentation) to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where applicable, search terms used)
eKOMPASS (IPC) externally & keywords: HVAC system, running cost, thermostat, and processor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
1	JP 2010-040318 A (MITSUBISHI HEAVY IND. LTD.) 24 December 2010 See paragraphs [0001] - [0005] and Figures 1, 2.	1-18
2	JP 2010-007024 A (DAIKIN ELECTRONICS CO., LTD.) 10 September 2010 See abstract and figures 3-5	1-18
3	JP 2010-080099 A (DAIKIN BLDG. SERVICES CO., LTD.) 09 July 2010 See abstract and Figure 1.	1-18
4	JP 2010-099027 A (MITSUBISHI HEAVY IND. LTD.) 16 February 2010 See abstract and figures 3, 4	1-18
5	US 6756421 B1 (HATCH, DONARD) 02 September 2004 See abstract and figure 1A	1-13



Further documents are listed in the continuation of Box C.



See patent family sheet.

* Special categories of cited documents:	* "Y" later document published after the international filing date or priority date and not in conflict with the application but used to understand the principle or theory underlying the invention
"X" document defining the general state of the art which is not considered to be of particular relevance	"X" document particularly relevant because the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken into account
"P" earlier application to patent has preceded one or after the international filing date	"Y" documents of particular relevance, the document(s) cannot be considered to involve an inventive step since the document is contained with one or more other such documents, each contribution being obvious to a person skilled in the art
"C" document which may, through double or multiple claims, be which is cited to establish the publication date of citation or other special reason (as specified)	"G" document, neither of the same patent family
"A" document referring to a new disclosure, use, modification or other aspect	
"W" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

05 August 2013 (05.08.2013)

Date of mailing of the international search report

06 undefined 2013 (06.08.2013)

Name and mailing address of the ISA/RAR

Korean Intellectual Property Office
636 Changgyeong, Seongju, Daegu Metropolitan City,
703-701, Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

KIM Jin Ho

Telephone No. +82-42-481-6966



Form PCT/ISA/210 (revised sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2013/035726

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2010-286218 A	24/12/2010	None	
KR 10-1999-0070368 A	15/09/1999	CN 1119579 C	27/08/2003
		CN 1226663 A	25/08/1999
		CN 1226663 C	25/08/1999
		JP 03011715 B2	21/02/2000
		JP 11-281122 A	15/10/1999
		US 6145328 A	14/11/2000
JP 05 189659 A	30/07/1993	JP 07001511 B2	11/01/1995
JP 2010-038377 A	18/02/2010	None	
US 6786421 B2	07/09/2004	US 2003-0142121 A1	31/07/2003
		US 2004-0074978 A1	22/04/2004
		US 6824069 B2	30/11/2004
		US 7152806 B1	26/12/2006

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

KING, JOHN, R.

KNOBBE, MARTENS, OLSON & BEAR, LLP 2040 MAIN STREET, 14TH FLOOR IRVINE CA 92614 USA

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) 06 undefined 2013 (06.08.2013)

Applicant's or agent's file reference

EFACT014WO

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/US2013/035726

International filing date (day/month/year)

09 April 2013 (09.04.2013)

Applicant

ECOFACOR, INC.

- 1 ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland. Facsimile No.: +41 22 338 82 70

For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to any protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the PCT Applicant's Guide, National Chapters.

Name and mailing address of the ISA/KR



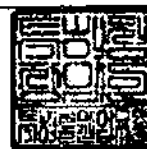
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-8753



Form PCT/ISA/220 (July 2010)

Received Orange County Docketing

AUG 13 2021

Knobbe, Martens, Olson & Bear LLP

* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for three months from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT Services => PCT Services

ID : PCT international application number

PW : **HZE474K4**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: ipkc@ipkcenter.com

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference EFACT014WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2013/035726	International filing date (day/month/year) 09 April 2013 (09.04.2013)	(Earliest) Priority Date (day/month/year) 14 June 2012 (14.06.2012)
Applicant ECOFACOR, INC.		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (See Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 2
☐ as suggested by the applicant.
☒ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
b. ☐ none of the figure is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/035726

A. CLASSIFICATION OF SUBJECT MATTER

F24F 11/02(2006.01); G05D 23/00(2006.01); G06Q 50/06(2012.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F 11/02; F23N 1/00; F24F 5/00; G07F 15/08; G05D 23/00; G06Q 50/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & keywords: HVAC system, running cost, thermostat, and processor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2010-286218 A (MITSUBISHI HEAVY IND. LTD.) 24 December 2010 See paragraphs [0021]-[0025] and figures 1,2.	1-18
A	KR 10-1999-0070368 A (SAMSUNG ELECTRONICS CO., LTD.) 15 September 1999 See abstract and figures 3,4.	1-18
A	JP 05-189659 A (HITACHI BILL SHISETSU ENG. KK.) 30 July 1993 See abstract and figure 1.	1-18
A	JP 2010-038377 A (MITSUBISHI HEAVY IND. LTD.) 18 February 2010 See abstract and figures 1,2.	1-18
A	US 6786421 B2 (ROSEN, HOWARD) 07 September 2004 See abstract and figure 1A.	1-18

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

05 August 2013 (05.08.2013)

Date of mailing of the international search report

06 undefined 2013 (06.08.2013)

Name and mailing address of the ISA/KR



Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan City,
302-701, Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

KIM Jin Ho

Telephone No. +82-42-481-8699



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2013/035726

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2010-286218 A	24/12/2010	None	
KR 10-1999-0070368 A	15/09/1999	CN 1119579 C	27/08/2003
		CN 1226663 A	25/08/1999
		CN 1226663 C	25/08/1999
		JP 03011715 B2	21/02/2000
		JP 11-281122 A	15/10/1999
		US 6145328 A	14/11/2000
JP 05-189659 A	30/07/1993	JP 07001511 B2	11/01/1995
JP 2010-038377 A	18/02/2010	None	
US 6786421 B2	07/09/2004	US 2003-0142121 A1	31/07/2003
		US 2004-0074978 A1	22/04/2004
		US 6824069 B2	30/11/2004
		US 7152806 B1	26/12/2006

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
KING, JOHN, R.

KNORRE, MARTENS, OLSON & BEAR, LLP 2040 MAIN
STREET, 14TH FLOOR IRVINE CA 92614 USA

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 06 undefined 2013 (06.08.2013)

Applicant's or agent's file reference
EFACT014WC

FOR FURTHER ACTION
See paragraph 2 below

International application No. PCT/US2013/035726	International filing date (day/month/year) 09 April 2013 (09.04.2013)	Priority date(day/month/year) 14 June 2012 (14.06.2012)
---	---	---

International Patent Classification (IPC) or both national classification and IPC
F24F 11/02(2006.01); G05D 23/00(2006.01); G06Q 50/06(2012.01)

Applicant
ECOFACOR, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects to the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66, Item(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR Korean Intellectual Property Office 189 Cheongdam-ro, Seo-gu, Daejeon Metropolitan City, 305-385, Republic of Korea Facsimile No. +82-42-471-7340	Date of completion of this opinion 05 August 2013 (05.08.2013)	Authorized officer KIM Jin Ho Telephone No. +82-42-491-8699
---	---	---

International application No.
PCT/US2013/035726

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:
- a. a sequence listing filed or furnished
- ☐ on paper
- ☐ in electronic form
- b. time of filing or furnishing
- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/035726

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-18	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

- D1: JP 2010-286218 A (MITSUBISHI HEAVY IND. LTD.) 24 December 2010
D2: KR 10-1999-0070368 A (SAMSUNG ELECTRONICS CO., LTD.) 15 September 1999
D3: JP 05-189659 A (HITACHI BILL SHISETSU ENG. KK.) 30 July 1993
D4: JP 2010-038377 A (MITSUBISHI HEAVY IND. LTD.) 18 February 2010
D5: S 6786421 B2 (ROSEN, HOWARD) 07 September 2004

1. Novelty and Inventive Step

1.1 Independent claim 1

None of the documents D1-D5 teach or fairly suggest a system for allocating the cost of operating an HVAC system comprising a thermostatic controller configured to turn on or off a first component associated with an individual unit of occupancy based on temperature reading from an inside of the individual unit of occupancy. Accordingly, claim 1 is not anticipated by any of the documents, nor is it obvious to a person skilled in the art by the documents, taken alone or in combination. Therefore, claim 1 is novel and involves an inventive step under PCT Article 33(2) and (3).

1.2 Dependent claims 2-9

Claims 2-9 are directly or indirectly dependent on claim 1 and therefore meet the requirements of PCT Article 33(2) and (3).

Continued on Supplemental Box

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2013/035726

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. V

1.3 Independent claim 10

Claim 10 concerns a method for allocating the cost of operating an HVAC system, but it has the same technical features as claim 1. Thus, the same reasoning applies to claim 10. Therefore, claim 10 is novel and involves an inventive step under PCT Article 33(2) and (3).

1.4 Dependent claims 11-18

Claims 11-18 are directly or indirectly dependent on claim 10 and therefore meet the requirements of PCT Article 33(2) and (3).

2. Industrial Applicability

Claims 1-18 meet the requirement of industrial applicability under PCT Article 33(4).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference CTACT014W3	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2013/035726	International filing date (<i>date de dépôt</i>) 09 April 2013 (09.04.2013)	Priority date (<i>date de priorité</i>) 14 June 2012 (14.06.2012)	
International Patent Classification (first edition unless other edition indicated) See relevant information in Form PCT/ISA/237			
Applicant ECOFACOR, INC.			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																										
<p>3. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statements under Article 25(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statements</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>			<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statements under Article 25(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statements	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																								
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<input checked="" type="checkbox"/>	Box No. V	Reasoned statements under Article 25(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statements																								
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<input type="checkbox"/>	Box No. VII	Certain defects in the international application																								
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																								
<p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 46bis.3(c) and 50bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).</p>																										

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 21, Switzerland</p> <p>Facsimile No. +41 22 430 02 70</p> <p>Form PCT/IB/373 (January 2004)</p>		<p>Date of issuance of this report 16 December 2014 (16.12.2014)</p> <p>Authorized officer Nora Lindner</p> <p>e-mail: pat5.pct@wipo.int</p>
--	--	---

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

KING, JOHN, R.

KNOHIL, MARTINS, OLSON & BEAK, LLP 2000 MAIN
STREET, 14TH FLOOR DRYDEN LA 92514 USA**PCT**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 06 undefined 2013 (06.08.2013)Applicant's or agent's file reference
EEFACT014WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/US2013/035726International filing date (day/month/year)
09 April 2013 (09.04.2013)Priority date (day/month/year)
14 June 2012 (14.06.2012)

International Patent Classification (IPC) or both national classification and IPC

F24F 11/02(2006.01); G05D 23/00(2006.01); G06Q 50/06(2012.01)

Applicant

ECOFACOR, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(ii) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1(b)(ii) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 32 months from the priority date, whichever expires last.

For further options, see Form PCT/ISA/220

Name and mailing address of the ISA/KK
European Industrial Property Office
159 C. Desgarets, 80000, France
Munichstein City, 702-701, Republic of
Korea
Facsimile No. +82-42-472-7140

Date of completion of this opinion
05 August 2013 (05.08.2013)

Authorized officer

KIM Jin Ho

Telephone No. +82-42-481-8649



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2013/035726

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:
 - a. a sequence listing filed or furnished
 - ☐ on paper
 - ☐ in electronic form
 - b. time of filing or furnishing
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2013/035726

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-18	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: JP 2010-286218 A (MITSUBISHI HEAVY IND. LTD.) 24 December 2010

D2: KR 10-1999-0070368 A (SAMSUNG ELECTRONICS CO., LTD.) 15 September 1999

D3: JP 05-189659 A (HITACHI BILL SHISETSU ENG. KK.) 30 July 1993

D4: JP 2010-038377 A (MITSUBISHI HEAVY IND. LTD.) 18 February 2010

D5: S 6786421 B2 (ROSEN, HOWARD) 07 September 2004

1. Novelty and Inventive Step**1.1 Independent claim 1**

None of the documents D1-D5 teach or fairly suggest a system for allocating the cost of operating an HVAC system comprising a thermostatic controller configured to turn on or off a first component associated with an individual unit of occupancy based on temperature reading from an inside of the individual unit of occupancy. Accordingly, claim 1 is not anticipated by any of the documents, nor is it obvious to a person skilled in the art by the documents, taken alone or in combination. Therefore, claim 1 is novel and involves an inventive step under PCT Article 33(2) and (3).

1.2 Dependent claims 2-9

Claims 2-9 are directly or indirectly dependent on claim 1 and therefore meet the requirements of PCT Article 33(2) and (3).

Continued on Supplemental Box

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2013/035726

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. V

1.3 Independent claim 10

Claim 10 concerns a method for allocating the cost of operating an HVAC system, but it has the same technical features as claim 1. Thus, the same reasoning applies to claim 10. Therefore, claim 10 is novel and involves an inventive step under PCT Article 33(2) and (3).

1.4 Dependent claims 11-18

Claims 11-18 are directly or indirectly dependent on claim 10 and therefore meet the requirements of PCT Article 33(2) and (3).

2. Industrial Applicability

Claims 1-18 meet the requirement of industrial applicability under PCT Article 33(4).

Electronic Acknowledgement Receipt

EFS ID:	21766857
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/ThuyQuyen Nguyen
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	13-MAR-2015
Filing Date:	11-MAY-2012
Time Stamp:	16:31:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011C1_ids.pdf	394161 7a12251a06ba3e4110251189d95f74b3a401b c1d26	yes	7

Multipart Description/PDF files in .zip description

Case 6:20-cv-00078-ADA Document 68-2 Filed 04/29/21 Page 1563 of 2039

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Transmittal Letter			1	2	
Information Disclosure Statement (IDS) Form (SB08)			3	7	
Warnings:					
Information:					
2	Foreign Reference	EFACT-011C1_REF94.pdf	626689	no	9
			f3c1b52d111a1f1a2a0e6e9a177199a111c		
Warnings:					
Information:					
3	Foreign Reference	EFACT-011C1_REF95.pdf	431508	no	9
			027719b011c68a782f16198c1b1b02a1f011941		
Warnings:					
Information:					
4	Foreign Reference	EFACT-011C1_REF96.pdf	281986	no	10
			8a76190615a5a01930a09b2a0b9c01b15c11b1		
Warnings:					
Information:					
5	Foreign Reference	EFACT-011C1_REF97.pdf	172303	no	2
			d11c168a50b57c0101b1d088c1121b1749b15		
Warnings:					
Information:					
6	Foreign Reference	EFACT-011C1_REF98.pdf	53482	no	2
			9a5f1f67abec1982f1d1f5d81745801d1b112c1		
Warnings:					
Information:					
7	Foreign Reference	EFACT-011C1_REF99.pdf	170603	no	5
			e2f61508d494a0b07908da1cc1a1215a175272492		
Warnings:					
Information:					
8	Foreign Reference	EFACT-011C1_REF100.pdf	143473	no	3
			17c11a011b1b1a0b1121809da9a07a08d1b20b14		
Warnings:					
Information:					

9	Foreign Reference	EFACT-011C1_REF101.pdf	4384010 cc11ac0ab0820a4ad1e808f0e7d0d08e00 fe7e7e	no	125
Warnings:					
Information:					
10	Non Patent Literature	EFACT-011C1_REF103.pdf	144459 910944210790A1149990c0c0a80d50926301 91909	no	2
Warnings:					
Information:					
11	Non Patent Literature	EFACT-011C1_REF104.pdf	1210514 ac528fcbcdca1148200b5720e2b162700f55 fe1127e	no	18
Warnings:					
Information:					
12	Non Patent Literature	EFACT-011C1_REF105.pdf	10274880 09111e70bc20c07c05c61189b2c8ca789ec a010	no	89
Warnings:					
Information:					
13	Non Patent Literature	EFACT-011C1_REF107.pdf	1253996 1719a0a61042ad0f5d9121475c807d0e2b1 1e5ab01	no	18
Warnings:					
Information:					
14	Non Patent Literature	EFACT-011C1_REF110.pdf	625697 d6a180b142963c0cc61542281a148165705 6f10f	no	7
Warnings:					
Information:					
15	Non Patent Literature	EFACT-011C1_REF111.pdf	753190 81137da74191e1bb445810e9ed293e2378b 1e15ab01	no	6
Warnings:					
Information:					
16	Non Patent Literature	EFACT-011C1_REF114.pdf	349730 c741d2801a5d11e85c022aa0Bce967ab84 01b	no	10
Warnings:					
Information:					
17	Non Patent Literature	EFACT-011C1_REF115.pdf	165146 c1e0244817d058088200bd92a006151477b 50ff0d	no	5
Warnings:					
Information:					
0342					

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: EFACT.011C1

Customer No. 20,995

INFORMATION DISCLOSURE STATEMENT

Inventor	: John Douglas Steinberg
App. No.	: 13/470074
Filed	: May 11, 2012
For	: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Ziaul Karim
Art Unit	: 3744
Conf. No.	: 4061

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Pursuant to 37 CFR 1.56, an Information Disclosure Statement listing references is provided herewith. References numbered 1-93, 102, 106, 108-109, and 112-113 are of record in U.S. Patent Application No. 12/502,064, filed July 13, 2009, which is relied upon for an earlier filing date under 35 USC 120. Accordingly, copies of references numbered 1-93, 102, 106, 108-109, and 112-113 are not submitted pursuant to 37 CFR 1.98(d).

No Disclaimers

To the extent that anything in the Information Disclosure Statement or the listed references could be construed as a disclaimer of any subject matter supported by the present application, Applicant hereby rescinds and retracts such disclaimer.

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a First Office Action on the merits, and presumably no fee is required. If a First Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner

Application No.: 13/470074

Filing Date: May 11, 2012

is authorized to charge the fee set forth in 37 CFR 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: March 13, 2015

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

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031315



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/470,074	05/11/2012	John Douglas Steinberg	EPACT.011G1EN

CONFIRMATION NO. 4061

PUBLICATION NOTICE



OC000000056272116

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Title: SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Publication No. US-2012-0221151-A1

Publication Date: 08/30/2012

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 ADDRESS COMMISSIONER FOR PATENTS
 P.O. Box 150
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/470,074	05/11/2012	John Douglas Steinberg	EPACT.011GEN

CONFIRMATION NO. 4061

POA ACCEPTANCE LETTER



20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 06/14/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/08/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/atesfai/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Docket No.: EFACT.000GEN

Customer No. 20,995

**REVOCATION & GENERAL POWER OF ATTORNEY
and
CHANGE IN CORRESPONDENCE ADDRESS**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The undersigned is an empowered representative of the Assignee and hereby appoints the registrants of Knobbe, Martens, Olson & Bear, LLP, **Customer No. 20,995**, as attorneys and agents to represent the Assignee before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned to the Assignee according to the USPTO assignment records or assignment documents supplied with an accompanying Statement Under 37 CFR § 3.73(b). This appointment is to be to the exclusion of the inventor(s) and his attorney(s) in accordance with the provisions of 37 CFR § 3.71.

Submission of this paper in connection with any matter of the below named assignee, together with a statement under 37 CFR 3.73(b), shall serve to revoke any previous powers of attorney in that matter.

Attached is a Statement Under 37 CFR § 3.73(b), signed by a registrant of Knobbe, Martens, Olson & Bear, LLP, setting forth a full chain of title for the subject application owned by the Assignee named below.

Please recognize or change the correspondence address for the application identified in the attached Statement to **Customer No. 20,995**.

By: 
John Douglas Steinberg

Date : 7/15/2010

Title: CEO

Assignee: EcoFactor, Inc.

Address: 423 Broadway, #801
Millbrae, CA 94030

9154025:ad 071410

Docket No.: EFACT.011C1

Customer No. 20,995

STATEMENT UNDER 37 CFR § 3.73(b)
ESTABLISHMENT OF ASSIGNEE

Applicant : John Douglas Steinberg
App. No. : 13/470,074
Filed : May 11, 2012
For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A
SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner : Unknown
Group Art Unit : 3744

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This document is being filed with a copy of a Power of Attorney signed by the Assignee. This Statement sets forth the chain of title of the above-identified application.

EcoFactor, Inc., a corporation, is the Assignee of the entire right, title, and interest of the above-referenced application by virtue of:

The Assignment from the inventor to the Assignee recorded in the United States Patent and Trademark Office on January 25, 2011, at Reel 025711, and Frame 0876.

The undersigned is an agent of Customer Number 20,995 and is authorized to act on behalf of the Assignee. Please recognize or change the correspondence address for the above-identified application to **Customer No. 20,995**.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 6-8-2012

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

13419408:ad
060812

INFORMATION DISCLOSURE STATEMENT

Applicant : John Douglas Steinberg
App. No. : 13/470,074
Filed : May 11, 2012
For : SYSTEM AND METHOD FOR USING A WIRELESS DEVICE
AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner : Unknown
Art Unit : 3744
Conf. No. : 4061

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Submitted herewith in the above-identified application is an Information Disclosure Statement listing references for consideration. References numbered 1-109 and 112-124 are of record in U.S. Patent Application No. 12/502,064, filed July 13, 2009, which is relied upon for an earlier filing date under 35 USC 120. Accordingly, copies of references numbered 1-109 and 112-124 are not submitted pursuant to 37 CFR 1.98(d).

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a first Office Action on the merits, and presumably no fee is required. If a first Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 CFR 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 6-8-2012

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 1 OF 5		Examiner
		Attorney Docket No. EFACT.011C1

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,136,732	01-1979	Demaray et al.	
	2	4,341,345	07-1982	Hammer et al.	
	3	4,403,644	09-13-1983	Hebert	
	4	4,475,685	10-1984	Grimado, et al.	
	5	4,655,279	04-1987	Harmon	
	6	4,674,027	06-16-1987	Beckey	
	7	5,244,146	09-1993	Jefferson et al.	
	8	5,270,952	12-1993	Adams et al.	
	9	5,314,004	05-1994	Strand et al.	
	10	5,462,225	10-1995	Massara et al.	
	11	5,544,036	08-1996	Brown et al.	
	12	5,555,927	09-1996	Shah	
	13	5,572,438	11-05-1996	Ehlers, et al.	
	14	5,682,949	11-04-1997	Ratcliffe et al.	
	15	5,717,609	02-10-1998	Packa, et al.	
	16	5,818,347	10-06-1998	Dolan et al.	
	17	5,977,964	11-1999	Williams et al.	
	18	6,145,751	11-14-2000	Ahmed	
	19	6,178,362	01-23-2001	Woolard, et al.	
	20	6,260,765	07-2001	Natale et al.	
	21	6,351,693	02-26-2002	Monie	
	22	6,400,996	06-04-2002	Hoffberg et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 2 OF 5	Attorney Docket No.	EFACT.011C1

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Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	13/470074
	Filing Date	05-11-2012
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 3 OF 5		Examiner
		Attorney Docket No. EFACT.011C1

U.S. PATENT DOCUMENTS					
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PTO/SB/08 Equivalent

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	Art Unit	3744
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U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 5 OF 5		Examiner
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Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
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(71) Applicant: Shaw, Allan, Dr.
5th Floor, Security House 233 North Terrace
Adelaide South Australia(AU)

Applicant: Luxton, Russell Estcourt, Prof.
5th Floor, Security House 233 North Terrace
Adelaide South Australia(AU)

Applicant: LUMINIS PTY. LIMITED
5th Floor Security House 233 North Terrace
Adelaide South Australia 5000(AU)

(72) Inventor: Shaw, Allan, Dr.
5th Floor, Security House 233 North Terrace
Adelaide(AU)
Inventor: Luxton, Russell, Estcourt, Prof.
5th Floor, Security House 233 North Terrace
Adelaide, South Australia(AU)

(74) Representative: Whalley, Kevin et al
M'CAW & CO. 41-51 Royal Exchange Cross
Street
Manchester M2 7BD(GB)

(54) Comfort integration and energy efficient method of air conditioning.

(57) An air conditioned space is cooled within a narrow target zone (as depicted on a psychrometric type chart) within which human occupants of the conditioned space would feel thermally comfortable, wherein factors including the heat transfer resistance of occupants' clothing and level of physical activity determine the target zone, by a method which includes correction of operative temperature, relative air velocity and humidity within the conditioned space 104, inherently controlling humidity by control of effective dehumidifier size 102 while maintaining a low face velocity of air and a high velocity of coolant flow, but varying either, or both, dehumidifier size 102 and the leaving air temperature if humidity ratio falls below four or exceeds thirteen grams of water per kilogram of dry air.

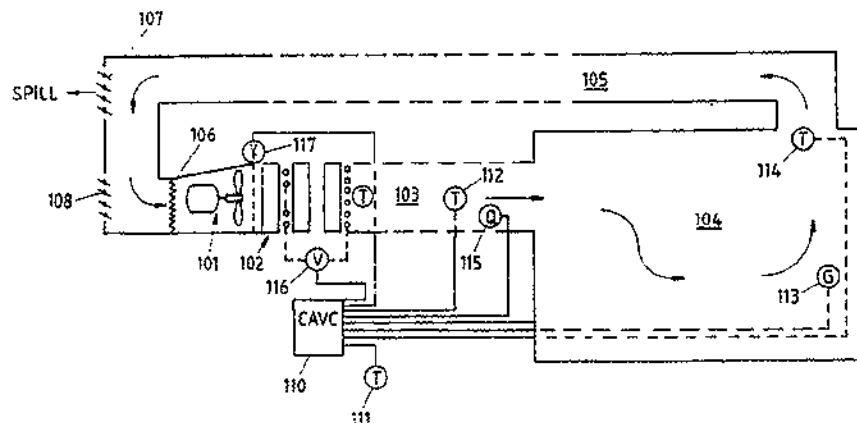


FIG 6a

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METHOD AND MEANS OF AIR CONDITIONING

This invention relates to a method of air conditioning and a means of controlling an air conditioner in such manner as to achieve thermal conditions which closely approximate those recommended by the ASHRAE Standard on Thermal Environmental Conditions for Human Occupancy, or other similar standards based on the "comfort equation", over a broad range of operating conditions.

6

BACKGROUND OF THE INVENTION

The ASHRAE Standard 55-1981 entitled "Thermal Environment Conditions for Human Occupancy" sets out the following parameters which require design attention:

Operative Temperature (typical ranges for a building in which occupants are mostly sedentary depend on humidity but span approximately 3.5 °C within the global ranges, summer 22 °C - 27 °C, winter 20 °C - 23 °C)

Humidity (4.2 - 12 g/kg moisture ratio)

Air movement (summer not exceeding 0.25 m/sec.),
(winter not exceeding 0.15 m/sec.)

Mean radiant temperature (operative temperature normally being an average of air temperature and mean radiant temperature)

Thermal resistance of clothing

Occupants' average metabolic rate (having regard to activity level).

A revision of this Standard, designated AINSI/ASHRAE Standard 55-81R has been released for public review and proposes tighter limits by specifying that the relative humidity should lie between 60% and 30% and narrowing the temperature range by approximately 0.5 °C.

This invention addresses all the above parameters, and, in addition, addresses the ventilation requirements which require a minimum air velocity through air distribution registers for proper diffusion of the supply air. It does not directly address other parameters listed in the Standard, such as non-steady and non-uniform temperature, radiant asymmetry and floor temperatures. It does, however, provide a means and method whereby operative temperature and the insulating effect of most people's clothing may be estimated, and whereby a conditioned space may be retained within that portion of the "comfort zone", illustrated for a specific example situation in the psychrometric chart on page 5 of the ASHRAE Standard, necessary to ensure also that the relative air velocity requirements, illustrated for example in Fig 17 of Chapter 8 of ASHRAE Fundamentals 1985, are satisfied at all times.

The ability to vary the volume of the conditioned air supply to offset the sensible load in individual zones often causes the Variable Air Volume (VAV) system to be preferred to the Constant Air Volume (CAV) system, in which variations in sensible load are accommodated by changing the conditioned supply air temperature but maintaining its volume flow. Both systems suffer from imperfections and these become manifest as the load sensed by the control system reduces, that is, as the sensible load reduces. In VAV systems often the volume of ventilation air delivered to the minimum load zone is insufficient to avoid stuffiness; lack of air motion accentuates the sense of discomfort and dissatisfaction felt by the occupants. Also the humidity of the air can rise to unacceptable levels at part load. The CAV system avoids the stuffy, stagnant air complaints but frequently results in even less acceptable levels of humidity.

The invention is applicable to both existing and new VAV or CAV systems.

Reference can be made to Australian patents 530554 and 597757, and U.S. Patent 4942740. These patents relate to some of a series of inventions for which patents have been granted or are pending and which trace the development of several methods of air conditioning which when combined become the method known as the low face velocity/high coolant velocity (LFV/HCV) method. This invention embodies features of said patents, and relates to a means and method whereby the thermal conditions for human comfort can be yet more closely achieved, which is the principal purpose of this particular invention. As indicated above the method may be used with both constant air volume (CAV) and variable air volume (VAV) systems and is compatible with all conventionally employed coolants. To a limited degree the present method can be made compatible with conventional systems which are unrelated to the earlier inventions by the proponents but is most readily effected in conjunction with the invention of said Patents 597757 and 4942740.

Physically based empirical equations have been developed to describe the thermal equilibrium between a human subject and the surroundings. The effects of each of the parameters discussed above on the rate

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of heat loss from the human subject are combined in an equation known as "the comfort equation". This long equation and its physical and empirical bases are succinctly summarized by B.W. Olesen in an article entitled "Thermal Comfort", Bruel & Kjaer Technical Review No. 2, 1982, and in more detail in standard texts. The physically based "comfort equation" allows the quantitative estimation of the various heat gains and losses by the subject but does not indicate the reaction of the subject to those gains and losses. Thermal comfort is defined as "that condition of mind in which satisfaction is expressed with the thermal environment". By testing the reactions of many hundreds of subjects to defined conditions within fully instrumented environmental test chambers, Professor P.O. Fanger of the Technical University of Denmark determined the most probable reactions of subjects and correlated these with the various effects on heat gains and losses embodied in the "comfort equation". This he did in a manner which allows the most probable "predicted mean vote" (PMV) of persons to their thermal environment to be deduced through solution of the "comfort equation". Fanger's results are compatible with those of Professor A.P. Gagge and others in the United States of America and have been verified and extended by researchers in many other countries. These results have been drawn together to form the basis for the ASHRAE Standard 55-81 on thermal environmental conditions for human occupancy. This Standard is advisory. It indicates the thermal conditions for which designers should aim in order to ensure that the majority of occupants feel thermally comfortable, i.e. not too hot, not too cold, not too moist, not too dry.

It is important to note that human comfort involves factors other than thermal comfort. Lighting level and colour, noise level and spectrum, posture, odour, touch, disturbance by breeze and by other persons can, if unacceptable, cause discomfort so nullifying attempts to satisfy conditions for thermal comfort to which the present invention specifically relates.

Numerous tables and charts have been constructed from the "comfort equation". No one single table or chart is sufficient to cover fully the influence of all the above listed variables. Nevertheless the major factors influencing human comfort are revealed by an examination of several of these charts. The aforesaid article by B.W. Olesen indicates that to illustrate all aspects of the "comfort equation" requires twenty eight different charts or diagrams.

The comfort equation expresses the energy balance between a person and their surroundings assuming that steady state equilibrium has been established. Using the notation of ASHRAE Fundamentals Handbook (1989) the total rate of energy output by the person in a steady state situation is equal to the metabolic rate. Some of this energy may be expended in performing mechanical work such as lifting a weight, as when walking up stairs, but the remainder appears as heat which must be lost to the surroundings if the person's basal temperature is to remain constant without the body invoking the thermoregulatory reactions of heavy sweating if too hot or shivering (to increase metabolic rate) if too cold. Thus the net rate of heat loss from the person per unit of skin surface area is (M-W) Watts per square metre.

The mechanisms by which the heat is lost are by transfer through the skin, Q_{sk} , and by transfer through the lungs, that is by respiration, Q_{res} .

The loss from the skin can be subdivided into a loss of sensible heat by convection, C, and by radiation, R, and a loss of latent heat through evaporation of moisture from the skin, E_{sk} .

The loss by respiration is substantial. It can be divided into a convective loss C_{res} and an evaporative loss E_{res} .

All quantities are expressed in units of Watts per square metre of skin surface. When a "standard" body surface area, known as the "Dubois surface area", is specified the metabolic rate may, for ease of comparison, be expressed in the "met" unit where 1 met = 58.2 W/m² 50 Kcal/(h.m²) is the metabolic rate of a healthy adult person when seated quietly.

For a nude subject the surface area of skin can be determined and the skin temperature measured at representative points. Furthermore the heat transfer coefficients for convection and radiation, hence the sensible heat exchange with the surroundings, and the rate of evaporation of moisture from the skin can be determined. Similarly the sensible heat and the moisture losses from the lungs can be obtained from empirical equations deduced by Professor Fanger. Thus, all parameters of the comfort equation may be determined for the nude subject.

The effect of clothing is to add a layer of insulation to parts of the body. This insulation may be described as if it is a single equivalent uniform layer over the whole body. The insulating value is expressed in the units of "clo" where 1 clo = 0.155 m². °C/W. The clothing also changes the surface area through which heat and moisture are exchanged with the surroundings and hence a small correction must be made to the Dubois surface area. The clo values for a wide range of garments from underwear to fur top coats have been tabulated in various reference books and are summarised in the aforesaid ASHRAE Standard.

Taking all factors into account P.O. Fanger in his book "Thermal Comfort", published in the readily available edition in 1982 by Krieger Publishing Company, Florida, developed the single equation which is

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the equation now most frequently referred to as "the comfort equation". The equation is written in the form given below. In the present invention ideally it is solved as an algorithm within the control system or, in the simplest realization, its solution is estimated from tabulated data for later combination with other data to set manually a zone thermostat.

8 The Fanger comfort equation is

$$(M-W) = 3.96 \times 10^{-7} t_{cl} [(t_{cl} + 273)^4 + (t_a + 273)^4]$$

$$+ t_{cl} h_c (t_{cl} - t_a)$$

$$+ 3.05(5.73 - 0.007(M-W) - p_a)$$

$$+ 0.42[(M-W) - 58.15]$$
12
$$+ 0.0173 M(5.87 + p_a)$$

$$+ 0.0014 M(34 - t_{cl})$$
where $t_{cl} = 35.7 - 0.0275 (M-W)$
 $t_{cl} = t_{cl} [(M-W)]$

$$+ 3.05(5.73 - 0.007(M-W) - p_a)$$
16
$$+ 0.42[(M-W) - 58.15] + 0.0173 M(5.87 + p_a)$$

$$+ 0.0014 M(34 - t_{cl})$$
and M = Metabolic energy production rate, W/m^2
 W = External work, W/m^2
 t_{cl} = Ratio of surface area of clothed body to that of nude body
20 t_{cl} = Temperature of surface of clothing, °C
 t_a = mean radiant temperature received by subject, °C
 h_c = convective heat transfer coefficient W/m^2K
 t_a = air temperature in conditioned space, °C
 p_a = partial pressure of water vapour in air, kPa
24 $k = 0.155 m^2 \cdot ^\circ C/(clo \cdot W)$ = a unit conversion
 t_{cl} = intrinsic clothing insulation.

The values of h_c and t_{cl} are given by

$$2.38 (t_{cl} - t_a)^{0.25}$$
 for $2.38 (t_{cl} - t_a)^{0.25} > 12.1 \sqrt{V}$
30 $h_c = 12.1 \sqrt{V}$ for $2.38 (t_{cl} - t_a)^{0.25} < 12.1 \sqrt{V}$
 $t_{cl} = 1.05 + 0.2 t_p$ for $t_p < 0.5$ clo
 $1.05 + 0.1 t_p$ for $t_p > 0.5$ clo
34 where V = relative velocity of air, m/s.

The difference between the left hand and right hand sides of the comfort equation is the thermal load on the body. The thermal load L is defined in ASHRAE 1988 Fundamentals Handbook as the difference between the internal heat production and the heat loss to the actual environment for a person hypothetically kept at comfortable skin temperatures and thermoregulatory sweat secretion rate for the actual activity level.

38 Fanger devised a voting scale for comfort and means of determining the predicted mean vote (PMV) of a large group of subjects for a given environment. The scale is

+3 hot
+2 warm
+1 slightly warm
42 0 neutral

-1 slightly cool
-2 cool
-3 cold

46 The predicted mean vote was found to be fitted closely by the equation

$$PMV = [0.903 \exp(-0.036 L)] + 0.025 L$$

where the thermal load L is determined from the comfort equation as indicated above.

The percentage of people dissatisfied with a given thermal environment may be related to the predicted mean vote and it has been found that not more than 10 percent of occupants will be dissatisfied, that is 90 percent will be satisfied, if

$$-0.5 \leq PMV \leq +0.5.$$

These limits define the range of conditions within which the thermal environment is controlled according to the present invention. It may be noted that even for a predicted mean vote of zero, five percent of the

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occupants are likely to be dissatisfied.

It must be stressed that this is one only of the criteria available for determining acceptable thermal environmental conditions. We seek here to establish the method of achievement of human thermal comfort rather than the specific criteria used to measure that thermal comfort.

5 While most designers are successful in satisfying the thermal comfort criteria at peak load conditions, few if any have been able also to satisfy the criteria at all operating loads without resorting to the mostly practice of overcooling and then reheating the air. This lack of success has caused many designers to ignore the recommendations of the aforesaid Standard. This in turn has contributed to the development of the "sick building syndrome". The problem stems from a fundamental incompatibility between the
10 recommendations of the Standard and the means by which conventional air conditioning systems are controlled.

It is the aim of this invention to remove this incompatibility to allow the requirements for the thermal comfort of occupants to be satisfied at all conditions of operation of the air conditioning system. To do this the broad comfort zone depicted on the aforesaid ASHRAE psychrometric chart must be subdivided into a
15 series of narrower bands each providing the "target" for operation over its own range of operating load conditions and occupant related characteristics.

The narrow "target zones" must embrace the wide range of clothing worn by occupants of an air conditioned space during the operating year, the diverse ranges of activity by the occupants varying from sedentary (met = 1) to very active (met = 3), and the need to consider relative air velocity (velocity of air over
20 occupants of a conditioned space), air dry bulb temperature, radiant temperature and operative temperature, volume flow rate of air, sensible and total heat load, and humidity ratio. If these matters are considered, the level of human comfort now deemed desirable can be achieved only by adjusting from one narrow target zone to another such that effectively a narrow "moving comfort target zone" is defined within the relatively broad ASHRAE Standard comfort zone. This moving target zone will occupy different positions on a
25 psychrometric, or psychrometric type, chart as both occupant related and system related conditions change during the operating year.

However, the Applicants herein have ascertained that under most climatic conditions the LFV/HCV air conditioning system, the subject of aforesaid U.S. Patent 4942740, can inherently restrain humidity in the occupied space from rising above the limit recommended by the aforesaid Standard. Control of relative air
30 velocity, supply air dry bulb temperature and dehumidifier size can, in this invention, achieve a design condition within the required very narrow target zone within the general comfort zone. The location of the target zone itself may be "moved" on a psychrometric chart, manually or automatically (or a combination of both), by changing control set points to accommodate changes in occupant clothing or activity, changes in the level of direct solar or other thermal radiation and changes in ambient conditions. Provided the building
35 design avoids excessive direct solar input through windows, diurnal adjustment is rarely required.

BRIEF SUMMARY OF THE INVENTION

40 In this invention, an air conditioned space is cooled within a narrow comfort target zone (as depicted on a psychrometric type chart), wherein factors including the heat transfer resistance of occupants' clothing and level of physical activity determine the target zone, by a method which includes mutual and sympathetic correction of operative temperature, relative air velocity and humidity within the conditioned space, inherently controlling humidity by control of effective dehumidifier size while maintaining a low face
45 velocity of air and a high velocity of coolant flow, but increasing either, or both, dehumidifier size and surface temperature if humidity ratio falls below four point two grams of water per kilogram of dry air.

Desirably, an electronic controller is employed which either directly or indirectly indicates to the means controlling the flow of supply air and to an Air Handling Unit controller the change in the requirements for the target zone so they may adjust appropriately. The difference between the ambient air enthalpy and that
50 in the conditioned space may also be sensed conventionally where economy cycle operation is required.

The preset parameters include adjustment for clothing and occupant activity, and in some instances for air flow velocity. Obviously there is considerable advantage in using the proponent's aforesaid invention the subject of said patents, especially in association with variable air volume since the increased dehumidification available at peak load due to reduction of the air flow velocity through the dehumidifier coil of
55 the Air Handling Unit greatly widens the range of simultaneous loads in different zones which can be accommodated; but as set out hereunder, a CAV system can also utilise this invention with considerable advantage if differences between the requirements of different rooms are not large, and/or if the CAV system allows stepwise changes of air flow volume.

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BRIEF SUMMARY OF THE DRAWINGS

An embodiment of the invention is described hereunder in some detail with reference to the accompanying drawings, in which:

- 5 Fig. 1 is a psychrometric chart on which is shown the comparative performances of a conventional VAV system and the integrated system of this invention,
- Fig. 2 is a psychrometric type chart which illustrates the effect of light clothing (0.5 clo) and intermediate clothing (1.0 clo) on the location of a target zone for sedentary occupation, and also the effect of high activity level, on the sensation of operative temperature by a human subject for a range of relative air
- 10 velocities between less than or equal to 0.1 metres per second and up to 1.5 metres per second.
- Fig. 3, extends the ASHRAE Standard 55 (1981) chart of the limits within which, statistically, 80 per cent of persons involved in mainly sedentary activity are likely to feel thermally comfortable, by superimposing for a range of combinations of clothing insulation and operative temperature, the diversity of clothing typical during the different seasons of the year, and the corresponding ranges of operative
- 15 temperature within which the conditioned space must be maintained to satisfy the 80 percent acceptability limits. (A draft ASHRAE Standard indicates that the acceptability limits shown in Fig. 3 apply to 90 per cent of occupants).
- Fig. 4 is a portion of a psychrometric chart which shows schematically movement of relative velocity lines with operative temperatures between peak and minimum load conditions as the typical clothing of
- 20 occupants varies during the cooling year. Also shown are the broad standard comfort zone and the revision of the upper and lower limits for humidity proposed by ASHRAE,
- Figs. 5A and 5B indicate the influence of relative velocity without and with the present comfort integration of this invention. The operative temperature scales on the abscissae have been aligned for clarity,
- Figs. 6A and 6B are diagrammatic representations of air conditioning installations which embody this
- 25 invention, Fig. 6A representing a constant air volume system servicing a single zone, and Fig. 6B representing a multizone variable air volume system,
- Fig. 7 is a diagrammatic representation of a dehumidifier, illustrating seven coil configurations which progressively reduce the effective size of the dehumidifier, to provide a series of steps so to retain high coolant velocity as heat load reduces,
- 30 Fig. 8 is a logic chart for a local controller incorporating the technology of this specification in a VAV system, and
- Fig. 9 is a logic chart for a local controller incorporating the technology in a CAV system.

35 BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 (full lines) is a psychrometric representation of this invention compared with that for a conventional VAV system (dashed lines).

- 40 As described in the specification of the LFV-HCV U.S. patent 49112740, the equilibrium room condition of a conventional VAV system, 3', is at a higher room humidity ratio than that for the LFV-HCV room condition, 3. As indicated in this example the equilibrium condition for the conventional system may rise to a moisture level which lies outside and above the area of acceptable comfort.

- Although the LFV-HCV room condition, point 3, lies within the area of acceptable comfort, more critical examination indicates that conditions in the room may not necessarily be comfortable. The prime criterion
- 45 of ASHRAE Standard 55-1981 is that at least 80 per cent of the occupants will feel thermally comfortable. As indicated in the previous section many factors influence this judgement or "condition of mind". It is a misconception to assume that the "comfort zone" indicated in that Standard is a sufficient requirement. Even that comfort area is only a graphical example in which the mean radiant temperature is assumed to be equal to the air dry bulb temperature. There is in fact a much smaller zone than that indicated in Fig. 1
- 50 which defines conditions which are both necessary and sufficient to satisfy the prime criterion of thermal comfort. This zone is determined by the other variables indicated earlier.

- The most accurate means presently available to determine optimum human comfort conditions is by use of the empirical equations from which most of the published charts are derived. This is the preferred method, though this invention does not depend on the specific method used provided it satisfies the
- 55 acceptability criteria for human comfort. Charts of restricted applicability which have been constructed from these equations will be employed in order to simplify the description of the invention.

Fig. 2 indicates the importance of relative air motion and level of activity. Three bands each traversed by four curves are presented. The first band and set of four curves on the right hand side (full lines)

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represent thermal comfort conditions for clothing values 0.5 clo respectively for relative air velocities of 1.5 m/s, 0.5 m/s, 0.2 m/s and less than or equal to 0.10 m/s, and mainly sedentary activity typical of that in an office building for which the metabolic rate is 1 met. The second band and set of four curves (dashed lines) represent comfort conditions, also for medium clothing (1.0 clo) when sedentary (1 met), while the left hand band and set of chain dashed lines represent comfort conditions for high activity (3 met) and light clothing (0.5 clo). The "target zone" within the right hand band is for temperatures about 26 °C, clothing 0.5 clo, relative velocity between ≤ 0.1 m/s and 0.25 m/s and relative humidity between 30% and 60%. At relative velocities above 0.25 m/s, although occupants may feel thermally comfortable, they find the direct effects of the relative velocity disturbing.

The curves indicate the large influences of activity and attire on the required operative temperature. For example, on a marginal day for a given relative velocity, equal satisfaction is felt by sedentary subjects wearing medium clothing (1.0 clo) in an operative temperature of 24 °C and by lightly attired (0.5 clo) subjects performing high activity in an operative temperature of 14 °C. Similarly on a hot summer day (right hand and left hand sets of curves which assume that occupants are attired in light clothing) 26 °C, 19 °C and 14 °C are all equally comfortable operative temperature conditions for sedentary (26 °C) and for high activity respectively, where the 19 °C relates to a very high air velocity (1.5 m/s) and 14 °C relates to air velocity ≤ 0.1 m/s. (The 1.5 m/s figure greatly exceeds ASHRAE recommendations but is shown to illustrate the effect of velocity).

On all the charts air velocity variations narrow the available area of optimum comfort. The authoritative ASHRAE Standard ASHRAE 55-1981 specifies:

"Summer: the average air movement in the occupied zone shall not exceed 0.25 m/s."

"Winter: the average air movement in the occupied zone shall not exceed 0.15 m/s."

Note that the maximum time-average air movement allowed in the occupied zone is lower in winter than in summer. It is also indicated in the ASHRAE Standard that if temperature and humidity are acceptable there is no minimum air movement that is necessary for thermal comfort.

In normal air conditioning practice it is unlikely that zone temperatures higher than 26 °C in the summer would be considered comfortable. However comfort within the Standard allows the temperature to increase to 28 °C if accompanied by an increase in air movement of 0.275 m/s for each degree C increase in zone temperature. In this instance the increase in air movement increases the rate of heat transfer from occupants to compensate for the higher temperature air in the room so maintaining comfortable skin temperatures and skin wettedness.

To put into perspective the maximum relative velocities for winter and for summer the ASHRAE 55-1981 Standard states,

"Loose paper, hair and other light objects may start to be blown about at air movements of 0.8 m/s (160 fpm)."

The above considerations underline the importance in air conditioning system design of ensuring that supply air and diffusers are so placed and designed to deliver air to the room in such manner that the relative velocities in the vicinity of the occupants lie within the range specified by the ASHRAE 55-1981 Design Standard, or its equivalent. This invention assumes this is achieved by using best practice design methods in designing the air distribution system for peak load operation and that the relative velocity at any given point in the room is proportional to the volume flow rate of air to the room. By reducing the range of volume flow rate variation between peak and minimum part load, the invention itself contributes to the satisfaction of this assumption.

Most of the data reported in the literature on comfort conditions relate to low air movements. For example Table 1 of Standard 55-1981 reports "operative temperature range for 80% thermal acceptability is based on an air movement of 0.15 m/s". Fig. 1 of the Standard, in which clothing insulation is plotted as a function of operative temperature for sedentary activity at 50% relative humidity, is also based on a relative velocity of ≤ 0.15 m/s.

To evaluate the extent to which existing air conditioning systems adhere to human comfort principles, the design performance of an actual variable air volume (VAV) system designed for a high-rise office building in a temperate climate on the western seaboard of Australia is considered. Many types of air conditioning systems could be employed. The superior performance of the LFV-HCV system in maintaining sensible temperatures and humidity ratios which are always within the area of comfort shown in Fig. 1 has already been established, and proven in practice. The performance of this already superior low energy multizone LFV-HCV system is now contrasted with a system which incorporates the comfort integration of the present invention into the design.

Before proceeding with the comparison, a brief outline of the LFV-HCV-VAV multizone system is presented.

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The following aspects of the conventional VAV system are retained in the LFV-HCV method:

A constant supply air temperature is maintained, the coolant flow rate is controlled to maintain the constancy of the supply air temperature, each zone has a thermostat which controls the damper settings to maintain the zone dry bulb temperature, the fan volume flow rate is regulated by one of a number of conventional methods to be compatible with the combined effect of the damper settings in the various zones.

However the LFV-HCV method is different from the conventional VAV system in that:

the system operates at a substantially lower face velocity,

the coolant velocity is higher, particularly at part load conditions during which the active size of the dehumidifier is reduced,

the fin density, circuiting and coolant temperature are important design factors in optimization of performance over the full operating range,

the system has a greater capacity to accommodate simultaneous multizone range variation, and

the system uses less energy.

The following is the method which would be used in an LFV-HCV system using VAV and in accordance with our aforesaid patents for an installation suitable for the example office:

A coil is selected to satisfy the design requirements of an air handling unit to supply a number of zones on a typical level of a high-rise office building located in a temperate climate. A room summer dry bulb temperature of 24°C is considered good design when coupled with a system which maintains humidity safely within the comfort areas shown in Fig. 4 (see for example Fig. 1). In Fig. 4, the standard broad comfort zone is shown in dashed lines and is cross-hatched. Apart from this and following best practice in the design of the air distribution system, no special regard is given to human comfort principles.

At peak load the selection provides a room condition of 24°C and 48 per cent relative humidity, and offsets the room sensible heat ratio of 0.87 for the local climatic design condition.

At 65 per cent of the room sensible load the selection provides a room condition of 24°C and 57 per cent relative humidity and offsets the room sensible heat ratio of 0.67 for a mild but humid part-load design condition, hereinafter called the humid part-load design condition.

During peak load conditions the building occupants will mostly be wearing light clothing. Thus the chart of Fig. 5A is the appropriate figure on which to indicate by an open circle the performance of the LFV-HCV system for peak conditions, without comfort integration. During humid part-load conditions, which occur most frequently during the Autumn, typical clothing will be a little heavier and the chart of Fig. 5B is applicable. The part load condition without comfort integration is again indicated by an open circle.

First, with reference to the peak load performance, at 24°C , 48% RH, the room condition lies significantly below the relative velocity for comfort marked "less than 0.1 m/s". Thus, for 80% of occupants to be comfortable the air flow velocity must be less than 0.1 m/s. The fact that it appears that it must be significantly less than 0.1 m/s is not important as there is no minimum air movement specified as being necessary for thermal comfort if the operative temperature and humidity are satisfactory. Thus, if the air distribution system can achieve this low velocity, the performance is within the "acceptable" range.

The room condition achieved falls safely within the comfort zone of Fig. 4. However it is unlikely to be possible both to offset the peak load and to satisfy ventilation requirements without higher air velocities. The designer may be tempted to increase the supply air temperature and increase air volume at the expense of a higher fan cost. However this would aggravate the problem of increasing humidity in the conditioned space during humid part load operation. Thus this option should be rejected. Unless the ceiling is many metres above the floor it would be difficult to introduce the required volume flow of air while maintaining the low relative velocity demanded of the peak load design. Furthermore, during part load operation this air movement would be further decreased in a VAV system. Thus 24°C is not a practical room dry bulb temperature for peak load operation. Even though it would at first sight appear that the human comfort conditions, as represented by the "comfort zone" depicted in Fig. 3, could be met, in practical terms the thermal loads and statutory ventilation requirements would be difficult to meet while also satisfying the low levels of air movement required for comfort at peak load and would lead to stagnant conditions at part load. The required minimum standard of ventilation is 7.5 litres per second per person.

Reference is now made to the room condition of 24°C , 57% RH achieved during humid part-load operation: This is made thermodynamically compatible with the peak selection by reducing the active area of the dehumidifier coil and increasing the coolant flow velocity through the remaining active portions, according to the LFV/HCV invention, to offset both sensible and latent loads at the lower room sensible heat ratio of 0.67, a commonly occurring ratio for part-load conditions. But the relative velocity required for comfort at the design room condition (Figs. 5A and 5B) is greater than 0.4 m/s which is well above the maximum relative velocity recommended in the ASHRAE Standard. It is also incompatible with the peak

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load condition in that less air is supplied to the room but air motion is required to be many times greater. Thus at part-load the system, though it properly offsets the sensible and latent heat loads in their correct ratio while maintaining a comfortable humidity ratio in the room, fails to maintain an acceptable relative velocity. Had the system been a conventional VAV system, without the LFV-HCV improvements, the relative velocity required for comfort would be even greater to compensate for the higher humidity indicated by room condition 3' in Fig. 1.

The air distribution system is identical for both peak and humid part load operation, the latter of which requires only 65 percent of the air flow volume required by the former. Thus it would be impossible to provide the performances indicated on Fig. 5A as being required for comfort at both peak and humid, or indeed any other part load conditions. The air required to offset part loads could not possibly be delivered through the same supply air system in a way which results in a higher relative velocity than that at peak load.

Although the above example is a particular application, the result is typical of present best-practice. As can be seen, either directly or indirectly, this best-practice is incompatible with the ASHRAE 55-1981 Standard for Thermal Environmental Conditions for Human Occupancy, with the principles of human comfort presented in Chapter 8 of ASHRAE 1985 Fundamentals, and with the work of P.O. Fanger of the Laboratory of Heating and Air Conditioning at the Technical University of Denmark, inter alia.

An examination of the charts of Figs. 5A and 5B clearly indicates that the operative temperature in the air conditioned space should not be constrained to a constant value, but should be allowed to vary as a function of the particular room loads of the moment and the clothing appropriate to the season. In the above example in which the room temperature of 24°C was prescribed, it becomes clear that at peak loads this dry bulb temperature is too low and at part loads is too high for comfort to be achieved in a practical design.

The above analysis indicates that there is no logical means by which one could satisfy comfort standards while maintaining a fixed room dry bulb temperature in all the zones. In the cited example it was found to be impossible to maintain a relative velocity which satisfied the ASHRAE Comfort Standard. This conclusion must be qualified as it depends on the level of confidence in the Fig. 5 charts. To prepare these charts the dimensionality of the problem has been reduced by assuming that the air temperature equals the mean radiant temperature. The ASHRAE "area of comfort" (Fig. 4), on the other hand, is in terms of the "operative temperature". The "operative temperature" is defined in Paragraph 3.9 of ASHRAE Standard 55-1981 for the thermal environmental range for human comfort as "approximately the simple average of the air and mean radiant temperatures". Naturally, if the air temperature does equal the mean radiant temperature, as in an interior zone with low temperature lighting, this definition would be satisfied. Since often they will not be equal, the conclusions drawn from the use of Figs. 5A and 5B can only be regarded as qualitative. More detailed analysis based on the use of the full "comfort equation", from which the simplifications embodied in Figs. 4 and 5 are also distilled, show that these qualitative conclusions are nevertheless indicative of practical situations in which the mean radiant temperature differs from the dry bulb temperature, as would be found in most perimeter zones.

The chart values used in Fig. 4, even with the use of "operative temperature" as abscissa, deviate from the actual values derived from the full comfort equation when the insulation value of the clothing in the area designated "summer" differs from 0.5 clo. A correction factor of - 0.6°C per 0.1 clo is recommended in ASHRAE 55-1981. Thus for the marginal 65% part load condition of 24°C used in the example design, the operative temperature for a change from 0.5 clo to 0.9 clo would, under the conditions of Fig. 4 and Fig. 5 (where it is assumed that air temperature is equal to mean radiant temperature) require a shift of the comfort areas to the left by 2.4°C.

Clearly this points to a preference in the application of this invention for a control system which senses the true values and then employs the basic equations rather than using chart values. In this manner both seasonal and diurnal variations in the various rooms or zones can be accommodated.

Adherence to human comfort principles will thus be seen to require changes in design of air conditioning systems and equipment. The necessary changes in method, design methodology and equipment selection are addressed by the present invention.

By way of contrast, the following sets forth requirements for this invention:

In the analysis above it has been indicated that human comfort principles are not adequately addressed by existing air conditioning systems. These systems have not been designed to satisfy human comfort though many designers may have been under the misconception that, by maintaining room conditions within the bounds of the area marked on Fig. 4, comfort would be assured. These findings may go a long way to explaining the occupant dissatisfaction which has been the subject of both technical papers and Open Forum debates within the learned societies.

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It is the purpose of this invention to present a new method of air conditioning in which human comfort and proper air treatment may be integrated; that is, to present a method and system within which the air treatment is achieved by means which are compatible with all other requirements for thermal comfort at all times. The presentation of this method will continue to use as a vehicle the LFV-HCV-VAV system of U.S. patent 49112740. However as indicated above the method of this invention can also be extended, with modification, to the design of other types of air conditioning systems.

To demonstrate the invention and its numerous benefits, the performance of the LFV-HCV-VAV design with comfort integration will be determined for the same thermal design specifications as for the already superior system analysed above. It will enable a fair comparison of the new system and existing best-practice, and will support the assertion that, in this invention, human comfort principles can be integrated into the air conditioning system performance. Fig. 1 of ASHRAE Standards 55-1981 "Thermal Environmental Conditions for Human Occupancy" which provides the basis for Fig 3 indicates the operative temperature range within which 80% of occupants feel comfortable, if the humidity and air movement are also within acceptable limits. For summer conditions assuming clothing insulation is approximately 0.5 clo, the range is 22.8° C to 26.1° C. For humid part load conditions occurring in the Autumn when clothing insulation may be approximately 1.0 clo, the range is 19.5° C to 23.2° C. Thus the room operative temperature is set for peak load conditions to be 26° C and that for humid part load conditions to be 23° C, both of which temperatures are within the respective 80% acceptability ranges. These ranges are not mandatory but are selected to allow ready comparison with ASHRAE Standard 55-1981. It should be noted that they can be refined as indicated below.

In Fig. 3 the temperature ranges have been modified to allow for the typically lighter clothing generally worn in Australia, and to accommodate a mix of clothing weights being worn by occupants. This narrows the range of acceptable operative temperatures as indicated by the ranges designated by 'A', 'B' and 'C', in Fig. 3:

SUMMER RANGE 'A' is the operative temperature range for 80% acceptability assuming no jackets shed or donned.

MARGINAL RANGE 'B' is the similarly restricted comfort range during spring and autumn.

WINTER RANGE 'C' is the similarly restricted comfort range for heating.

These ranges expand in each direction by 0.6° C for each 0.1 clo donned (at the lower limit) or removed (at the upper limit). A light jacket adds 0.22 clo and a bolero 0.15 clo.

The following sets forth a design for an LFV-HCV-VAV system for human comfort:

In Fig. 4 is indicated the area of the ASHRAE Standard 55-1981 charts within which are satisfied the presently acknowledged human comfort conditions for peak (right hand area, 0.5 clo) and for humid part-load (left hand area, 1.0 clo) conditions for the design considered herein. A four sided area is marked in with the left side representing the boundary designating a relative velocity of <0.1 m/s and the right side a relative velocity of 0.25 m/s to define the range of acceptable relative velocities. To lie within the ASHRAE limits, the top border of the area would be represented by a dew point temperature of 16.6° C and the bottom border by a dew point temperature of 2.7° C. However in anticipation of a revision of the standard the upper and lower bounds of the ranges indicated in Fig. 4 follow the 60% and 30% Relative Humidity lines respectively. Fig. 4 indicates the mutually compatible area for each operating condition by close cross hatching. To adhere to the ASHRAE Standard and to the thermal conditions found to be appropriate for human comfort the designer is constrained to operate within the very much smaller areas defined by the close cross hatching in selecting the room operative temperature. In this case Fig. 4 indicates the peak load and the humid part load performance conditions achieved by allowing flexibility of the room operative temperature. Both conditions then fall within the range in which 80% of the occupants will feel that the conditions are comfortable. Not shown is the continuum of target zones within which conditions between peak and minimum load, indicated by the continuous line, must fall to satisfy thermal comfort over the full range of operation of the air conditioning system.

The left hand column of Table 1 appended to this specification indicates the probable performance of the system with a room thermostat which varies its setting progressively as the sensible load changes from its peak value. The system performances at sensible loads which are 65 per cent and 50 per cent of the peak value are shown.

Figs. 5A and 5B reveal a LFV-HCV-VAV system which is completely compatible with the air conditioning design loads and with human thermal comfort requirements over the full range from peak to the 65 per cent part load condition. Should the system move to a 50 per cent part load condition the chart relative velocity lines would also move slightly to the left to accommodate the heavier clothing which is likely to be worn. The room operative air temperature on the chart would change only from 23° C at 65 per cent part load to 22.8° C at a part load which is 50 per cent of the peak sensible load.

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Throughout the operating range the required relative velocity for optimum comfort would vary from 0.14 m/s at peak load conditions to 0.12 m/s at 65 per cent part load and to 0.09 m/s at 50 per cent part load. If the relative velocity in the room varies proportionally with the variation in volume flow of air supplied to the room and the room and supply air temperature is kept constant, the relative velocity at the 65 per cent condition would be 0.09 m/s and at 50 per cent, 0.07 m/s. If an increase in humidity is possible without exceeding the comfort level the small discrepancy between the relative velocity optimally desired and to relative velocity achieved could be eliminated by a small increase in the supply air temperature. This contrasts with the incompatibilities found in the earlier example design to the identical specification wherein it was found that a higher relative velocity was required for comfort at part load than that at peak load, an impossible situation.

The left hand column of Table 1 reveals the superior performance of this method in offsetting the thermal loads, meeting the ventilation loads, and achieving compatibility of the air supply requirements and the relative velocities required for comfort, thus simultaneously optimising performance and the known human comfort principles.

The above discussion and example may be summarised as follows:

Operating conditions which fall within the comfort area defined by ASHRAE Standard 55-81 may be necessary for creating "that condition of mind in which satisfaction is expressed with the thermal environment", but in most cases they will not be sufficient at all operating load conditions. At each operating load the constraints imposed by the relative velocity limits specified by ASHRAE Standard 55-1981 must also be satisfied. The relative velocity limits restrict acceptable conditions to a narrow band within the general comfort area and, in the example above, it was shown that this narrow band traverses from right to left in response to the changes from peak to minimum load conditions of the air conditioning system. It is this movement which is accommodated by the present invention. The aim is the simultaneous energy efficient integration of load, ventilation and human comfort requirements into the design of air conditioning systems.

Reference is now made to the system illustrated in Figs. 6A, 6B and 7.

In Fig. 6A, a Constant Air volume air conditioner comprises a fan 101 which propels air through a dehumidifier 102, a duct 103, and through a conditioned space 104. The air is returned to the fan 101 through duct 105 and filters 106. Some return air is spilled through one or more controlled or uncontrolled vents 107 and this is replaced with fresh air drawn from outside via a controlled or uncontrolled damper 108. Coolant is supplied to the dehumidifier from a chiller plant (not shown).

An electronic controller 110 receives the following intelligence from sensors
 ambient air temperature.....thermometer 111
 supply air temperature (optional).....thermometer 112
 conditioned space operative temperature directly or via.....globe thermometer 113
 conditioned space humidity (optional).....humidity sensor 126
 return air temperature.....thermometer 114
 supply air volume flow rate (optional)via pressure or velocity sensor 115.

The controller controls coolant valves collectively designated 116 and throttle valve 117, as well as spill and ventilation air dampers 107 and 108 if same are active. In a CAV system, flow control dampers in the supply air duct are not used but the fan motor may have the facility of being switched between two or more speeds under the command of the controller 110.

In Fig. 6B, a Variable Air Volume air conditioner comprises a fan 101 which draws air through a dehumidifier 102 and passes it via a duct 103 and dampers 109 to a conditioned space 104 from which it is returned to the dehumidifier 102 through a duct 105 and filters 106. As with the CAV system of Fig. 6A some return air is spilled through one or more controlled or uncontrolled vents 107 and is replaced with fresh air drawn from outside via a controlled or uncontrolled damper 108. Optionally there may be a spill fan 131 and/or a return air fan 132 and/or return air dampers 133 also in the return air path. Also a supply air damper 125 may be used to effect change in the volume of air delivered by the fan. Preferably such change would be effected by variation of the speed of the fan motor by means of variable speed drive 134.

The control function is shown in Fig. 6B to be divided between a local zone VAV controller 120 and the Air Handling Unit (AHU) controller 110. The two controllers can be combined into a single unit but for clarity here and for larger systems involving several zones it is convenient to locate the zone controllers 120, 220, 320, etc. within the several zones and use a Local Area Network (LAN) 140 or similar communication means to send and receive information to and from the Air Handling Unit controller.

The zone VAV controller 120 receives the following intelligence from sensors:
 supply air temperature at zone.....thermometer 112
 conditioned space operative temperature...directly or via.....globe thermometer 113

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zone and return air temperature.....thermometer 114
 supply air volume flow rate.....via pressure or velocity sensor 115
 zone supply damper setting.....angle 109.
 humidity (optional) RH or DP.....126

5 In addition the zone VAV controller 120 receives both sensed and processed intelligence from the AHU controller 110, for example information about ambient conditions.

Zone controller 120 has various manual inputs 119, some of which are set during commissioning of the system, some of which may be set seasonally, and in simple systems some of which may be input at intervals throughout a day. These manual inputs are delineated below in the discussion of the control
 10 function. Manual inputs common to all zones are best input directly to the AHU controller, as indicated by 121, and then communicated to all zones via the LAN 140 if a distributed control system, as illustrated, is employed.

At its simplest level the zone VAV controller could be a conventional thermostat which could be reset manually by the occupants of the zone with the aid of a look-up table of 40 settings for different times of
 15 year, levels of activity, sun angle and daily weather forecast. In more sophisticated applications the above parameters are either sensed directly or determined by calculation or from information stored in the memory banks of the controllers 110 and 120.

The AHU controller receives the following intelligence from sensors:

ambient air temperature.....temperature 111
 20 supply air temperature leaving AHU.....temperature 122
 mixture temperature entering AHU.....temperature 123
 enthalpy difference between return air and ambient.....enthalpy difference 124
 fan motor speed.....tachometer 134
 supply air damper setting (if fitted).....angle 125
 25 coolant throttle valve setting.....angle or travel 117
 dehumidifier change-over valve.....status 116
 spill fan (if fitted).....status 131
 return air fan (if fitted).....status 132
 return air damper setting (if fitted).....angle 133
 30 spill air damper setting (if active).....angle 107
 ventilation air damper setting (if active).....angle 108
 manual inputs.....alpha-numeric 121.

In addition the AHU controller sends information to and receives information from the various zone controllers and maintains communication with the central building system controller 118 via the building
 35 Local Area Network (LAN) 140.

Fig. 7 shows diagrammatically one possible configuration of the dehumidifier 102, which comprises three coil rows each with eight passes. It will be seen from Fig. 7 how, even with minimum effective size, the full area of air flow always intercepts active cooling coils. By bypassing flow in some coils (bypass tubes 135), high coolant velocity is maintained (U.S. patent 4942740).

40 The following sets forth the control system:

Reference is made to Figs. 8 and 9:

Each zone served by an air handling unit has a local controller, preferably but not essentially of the programmable type. At the minimum level of control a zone thermostat which is manually adjustable according to a table of settings is required. The following description relates to the use of a programmable
 45 controller in the absence of direct sensing of humidity. With humidity sensing the complete comfort equation and predicted mean vote can be solved as detailed earlier in this specification.

Two types of factors are required as inputs by the control system; physical/environmental factors and personal factors relating to the occupants. Factors of the first type may be sensed by conventional means. Factors of the second type may be deduced with the aid of tabulated data.

50 The local zone control function requires

- (a) estimation of the zone sensible load,
- (b) estimation of the actual operative temperature in the zone,
- (c) computation of the optimum and acceptable range of operative temperature,
- (d) determination of the 'offset' between (b) and the optimum,
- 55 (e) initiation of action to bring the 'offset' within the acceptable range.

The above functions are embodied in the zone control logic diagram, Fig. 8, for a VAV system. In the most preferred embodiment the optimum air temperature in the zone is calculated directly from the comfort equation to yield $L = 0$. Both humidity and mean radiant sensors must be fitted for this embodiment.

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We now consider each of the above control requirements in turn:

(a) The zone sensible load may be obtained from measurements of the volume flow rate q_v of the supply air (obtained either from the measurement of the pressure difference across some known restriction or from knowledge of the flow characteristic as a function of supply air damper angle for a measured supply air pressure) and measurement of the rise in temperature of the supply air between inlet to and outlet from the zone. The zone sensible load is then calculated from $Q_s = \rho_a Q_v c_p (t_a - t_r)$ where ρ_a is the density of the supply air, c_p is the specific heat of the air and t_a , t_r are the temperatures of the return (room) and supply air respectively. This expression can be recognised as the familiar relationship $Q_s = \dot{m} c_p \Delta t$ where \dot{m} is the mass flow rate of air and Δt is the temperature difference across the load.

(b) The actual operative temperature is approximately equal to the average of the mean radiant temperature t_r and the temperature t_a of the air in the room. The room air temperature may be measured directly by conventional means. The mean radiant temperature t_r is the uniform temperature of the surface of a radiantly black enclosure in which the occupant would exchange the same amount of heat by radiation as in the actual non-uniform room. It can be calculated if the room geometry and the temperatures of all surfaces are known. Such information is seldom known and hence approximations are necessary. The mean radiant temperature can, however, be derived from measurements of the air temperature, the relative velocity of air movement v and the "globe temperature" t_g . The latter is the temperature measured at the centre of a six inch (0.15m) diameter thin walled non-reflective sphere. The mean radiant temperature is then calculated from

$$t_r = t_g - k \sqrt{v} (t_g - t_a)$$

where temperatures are expressed in Celsius degrees, velocity is in metres per second and $k = 2.2$.

It has been found in tests that natural convection places a lower limiting value on the velocity v . Thus the above equation should carry the qualifying statement " $v \geq 0.05 \text{ m/s}$ ".

If the diameter, d , of the globe thermometer sphere differs from 0.15m, the value of k is adjusted according to the equation

$$k_d = k (0.15/d)^{1/4}$$

A.P. Gagge, G.M. Nappé and J. O. Hardy (ASHRAE Inc, May 1987, p.63) showed that if the outer surface of the standard globe is painted a skin colour, the temperature measured at its centre closely approximates the operative temperature. However the time constant for such a sensor is of the order of 20 minutes which, apart from its obtrusive bulk, makes it unsuitable as a control sensor in a practical air conditioning system. An integral part of the control system of the present invention is the use of unobtrusive miniature direct measuring operative or globe temperature sensors with short time constants. The relative velocity at the miniature globe location is measured during commissioning of the system. By this means a good approximation to the mean radiant temperature may be obtained. In practice several miniature globes are used to sample the distribution of mean radiant temperature through the zone. ASHRAE Standard 55-1981 specifies the locations at which measurements should be made.

(c) The optimum operative temperature is that operative temperature which satisfies the greatest number of similarly clad occupants in a given room for a given relative humidity and given relative velocity. The acceptable range of operative temperatures for these subjects is variously defined but ASHRAE Standard 55-1981 specifies acceptability as being the band of conditions within which eighty per cent of occupants are slightly cool, neutral or slightly warm. It is possible to determine this band by calculation from the "comfort equation" and reference to statistical data derived from the responses of many volunteers who participated in tests, as described earlier in this specification. In the proposed revision of the Standard, designated (55-1991R), the acceptance criterion has been raised to ninety per cent. The present embodiment further allows for the most probable range of clothing worn by occupants at a given time.

(d) The "offset" between the calculated operative temperature and the optimum operative temperature is obtained by simple difference. This difference is then compared with the "acceptable range" of operative temperatures.

(e) If the offset is not within the acceptable range the control system then initiates corrective action by changing the air temperature in the zone. Typically this would involve an increase or decrease of the air flow to the zone which could be achieved by the opening or closing of the supply air damper in the duct leading to the particular zone.

Note that items (b) and (c) require a knowledge of the insulating values of the range of clothing most likely to be being worn by the occupants of the building or of a particular room or zone of the building. Several means by which this may be determined or estimated may be envisaged. For example, in some zones within a building the occupants may all be required to wear a particular uniform or protective clothing at all times. The insulation value, measured in the units of clo where 1 clo = $0.155 \text{ m}^2 \text{ K/W}$, can be accurately measured and then becomes a unique value in the calculations. For such a circumstance the

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range of acceptable temperatures is a maximum.

By contrast, in a typical office building or department store the range of clothing worn by the occupants is usually diverse. It would be possible for a doorman with a trained eye to assess the range of clothing being worn as employees arrive at work. This information could then be translated into a range of clo values. The wider the range of clo values to be accommodated, the narrower is the range of temperatures which are acceptable.

An alternative to use of the observing skills of a doorman would be to estimate the most probable range of clothing being worn. The choice of clothing depends on the local culture, on the type of activity, on the time of year and on the early morning weather forecast. Within a given culture and type of activity, the time of year can be determined from the clock within the computer or controller and the likely variation about the clothing typical of that time of year is dependent largely on the outside ambient temperature, which can be measured directly. Thus estimates of the likely range of clo values for that particular day may be made. It is good practice to err on the high side in making this estimate during the cooling period as it is usually easier for a well clad person to remove a coat or jacket than for a lightly clad person to find means to keep warm.

In addition to the local zone controls, the Air Handling Unit operation is also supervised by a controller. At the simpler level this controller is an air-off thermostat, which actuates a valve or valves to adjust the flow of coolant through the dehumidifier coil so to maintain the air-off temperature constant, and conventional means of measuring and controlling the air supply volume for a VAV system, or to keep the zone temperature at the set point determined by the zone controller for the CAV system. It is better practice for the controller to be a programmable controller which receives data from each of the zone controllers and, from a pre-programmed "performance map" for the particular system, determines the optimum combination of operating point for the air flow fan, active coil area, coolant flow rate and, in the case of a direct expansion (DX) system, the speed of the compressor.

The control system described herein maintains an ongoing record of past actions and of the results of these actions. These data can be used to update and refine the abovesaid performance map.

Referring now to the logic diagram for a VAV System, Fig. 8, the air flow volume q_v is proportional to Δp and is calculated by the controller according to the formula

$$Q_v = K_v \Delta p$$

where K_v is a proportionality constant determined during design or during commissioning. Alternatively q_v could be calculated from a flow vs damper angle calibration.

From the measurement of q_v may be obtained the quantity $m \rho_a c_p$, where m = mass flow rate of air and

$\rho_a c_p$ = specific heat of air.

ρ_a = density of supply air.

This quantity, when multiplied by the difference between the measured temperatures of the air leaving the zone t_z and the air supplied to the zone t_s , yields the zone sensible heat load Q_s , as indicated earlier.

From knowledge of the thermal characteristics of the building, determined during design or measured on site, and measurement of the ambient temperature, an estimate can be made of the part of the sensible heat load Q_s which is due to transmission of heat through the walls, windows and, where appropriate, roof of the building. Thus

$Q_{trans} = K_t(t_{amb} - t_z)$, where K_t is the relevant factor in the building characteristic. Allowance could if necessary be made for direct sun load on the wall or roof of the building.

It should be noted that the thermal mass of the building fabric will cause the building to respond only slowly to changes in either ambient or room temperature. Thus the actual value of Q_{trans} at any given time will be determined by the values of t_{amb} and t_z at earlier and usually different times. For this reason these values are stored and then retrieved after a time delay determined by the building time constant. The values of Q_{trans} are similarly stored for use in determining the internally generated sensible load in the zone as a function of time. This information is of value to building managers for planning purposes. Also, in a lightly constructed building as are many existing office buildings, the building time constant is short and the effects of changing the internal air temperature cause the transmitted sensible load to change after only a short time. In these circumstances it is appropriate to anticipate the change by computing a new sensible heat load as follows:

$$\text{old } Q_s = \text{old } Q_{trans} + \text{old } Q_{internal}$$

$$\text{new } Q_s = \text{new } Q_{trans} + \text{new } Q_{internal}$$

$$\text{But old } Q_{trans} = \text{new } Q_{trans}$$

$$\text{Hence new } Q_s =$$

$$\text{old } Q_s - \text{old } Q_{internal} + \text{new } Q_{internal}$$

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$$= \text{old } Q_s - K_3 (t_{arqd} - t_a)$$

where t_{arqd} is the new required air temperature and t_a is the existing air temperature.

From the new Q_s the required supply air quantity can be calculated from

$$(mc_p)_{rqd} = \text{new } Q_s / (t_{arqd} - t_a)$$

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$$\text{or } q_{srqd} = \frac{\text{old } Q_s}{\rho_s c_p (t_{arqd} - t_a)} - K_3 / \rho_s c_p$$

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The zone dampers can then be adjusted and information relayed to the AHU controller.

As an example of the many additional capabilities of the type of control system described herein, any discrepancy between the actual damper angle (ϕ), and the angle determined by the controller can be reported immediately to the computer based maintenance log. Limit alarms may be set and operating costs can be accurately recorded and reported in a readily understandable form.

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As a further feature of the control strategy of the present invention, when used in association with the LFV/HCV method of air conditioning which is the subject of US Patent 4942740, where the occupancy of the zones served by an AHU falls to zero in the evening, the system can be set to run on a maximum dehumidification cycle for a defined period to dry out all ducts, carpets, fabrics and papers. This may be achieved by operating with maximum coolant velocity in the portion of the coil which operates at minimum load, and reducing the face velocity, and hence the air flow volume, to not more than 0.5 metres per second. This procedure eliminates the possibility of mould or bacterial growth in the ductwork and on the building fabric and furnishings.

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The air handling unit (AHU) controller receives information from all local controllers (Fig. 8), adds together the sensible heat loads and the volumes of air demanded, sets the ventilation air quantity on the basis of the needs of the most lightly loaded zone and calculates the best combination of effective dehumidifier size, coolant flow rate, fan speed and main supply air damper position to satisfy the air supply needs of the conditioned zones. A time delay ensures that zone dampers are set after the setting of the AHU parameters. For a DX system the compressor speed (suction pressure) is also optimised.

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When radiation is important the air temperature does not equal the operative temperature and the diurnal and seasonal variations then ideally require a measure of mean radiant temperature, or a direct measurement of operative temperature, to be input to the control system, as indicated above. Nevertheless it is possible to achieve improved results from cheaper options such as allowing sensible load only to determine the room temperature, or the least expensive option of all, relying on the manual adjustment of each zone or room thermostat setting according to tabulated or calculated values derived from the comfort equation.

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The control logic for a CAV system, Fig. 9, differs from that for the VAV system, Fig. 8, only in the control action which is taken. Where the action taken in the VAV system is to adjust a damper angle and report data to the AHU controller, the CAV control system (which will usually be an integral part of the AHU control system) reports to the AHU controller the air temperature required in the zone to achieve the required operative temperature. The AHU controller then determines from the requirements of other zones, if any the optimum supply air temperature to minimise the reheat throughout the system.

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The following sets forth a constant air volume (CAV) system with comfort integration:

In the comparative analysis above with and without comfort integration, discussion has concentrated on a LFV-HCV-VAV system. This is because such a system now represents "best practice", as it combines low energy consumption and broad multizone capabilities. However, although the simultaneous air quantity required at any part of the diurnal cycle may not vary greatly because of the diversity in the demands of individual zones within a multizone VAV system, this very factor may reduce the air change rate in some low load zones below the necessary ventilation levels. The constant air volume (CAV) system does not suffer from this problem.

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In the conventional CAV air conditioning system the air flow rate is kept constant to all areas served and all areas are sufficiently similar for them to be treated as a single zone. The coolant flow rate is throttled with reduction in load, as in the case of the VAV system, but unlike the VAV system the leaving dry bulb temperature from the coil is allowed to rise to maintain a fixed room dry bulb temperature. This characteristic of the CAV system has an adverse effect on part load performance. The slope of the coil condition curve decreases during part load conditions resulting in reduced dehumidification per unit of cooling; this is precisely the opposite of that which is required to offset the lower sensible heat ratio. It is for this reason that in the past CAV systems have often employed overcooling to satisfy latent heat load and

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reheating to re-balance the sensible heat load. Where several zones are served by the one dehumidifier coil and zone differences are significant, practice has been to satisfy that zone requiring the lowest supply air temperature and to reheat the air as it is admitted to each other zone to achieve the required air condition in that zone. While the degree of comfort which can be achieved by such a system may be good, it uses energy at a rate which is now considered unacceptable for other than special applications by most responsible designers.

In the application of the comfort integration of this invention to a CAV system, which ideally should not be faced with zone diversity, rather than adapting to the sensible load by varying the sensible temperature of the supply air, supply air temperature and dehumidifier capacity are initially held substantially constant while the room or zone thermostat or controller is first reset to offset the load and to achieve as closely as possible the required operative temperature. If insufficient control is available by this means, and coil size is fixed, coolant flow through the dehumidifier is varied to result in a change in supply air temperature. This strategy maintains dehumidification capacity more effectively than does conventional practice. If zone diversity is present, part load rooms or zones are set to maintain a lower temperature than are peak load rooms. Terminal reheat requirements are thus reduced to "trimming".

Where a constant air volume system serves several zones these zones should, according to good design practice have very nearly the same behaviour of thermal load conditions. Where variations do occur, the zone with the consistently least thermal load would serve as a master zone governing all the zones on the same system and would determine the sensible temperature setting in that "master" zone. However reheat coils would be provided to the associated similar zones to permit adjustment of room temperatures to the same room sensible setting. Only when these other rooms have different mean radiant temperatures would it be necessary too to have variable room temperature thermostats to establish the appropriate room sensible setting given the mean radiant temperature and the seasonal operative temperature.

In lightly loaded interior zones it is known that the mean radiant temperature is equal to the room sensible temperature in which case the seasonal operative temperature will also be equal to the "master" zone sensible temperature setting and no separate measurement of mean radiant temperature is required. If perimeter zones are involved, measurement of radiant temperature in one zone only, together with predetermined information on diurnal diversity and tabulation of the typical seasonal operative temperatures will allow automatic (or manual) determination of the required room sensible temperature setting without the need for additional globe thermometers. The required room sensible temperature will be established through control of the chilled water throttling valve. The temperature regulating means and valves controlled by the controller operate in such manner as to limit the range of temperatures within the conditioned space to between 22°C and 27°C as established by comfort standards.

Although the systems described use more energy than do the VAV systems for the same duties, they are far less wasteful than the conventional CAV system which seeks to maintain a constant room dry bulb temperature in all rooms at all times. The important difference between the conventional CAV system and the CAV system with comfort integration is that in the latter the coil condition curve initially becomes steeper as load decreases so allowing the latent load to be offset without the need for such severe overcooling as that required by the conventional system.

The invention has further advantages:

In addition to satisfying thermal loads successfully and achieving optimum comfort, an examination of Table 1 reveals several further advantages contributed by the method of this invention. Here the same system of air conditioning, the LFV HCV-VAV system, is compared for the same design specification for the same office building, with and without comfort integration.

(a) The air handling unit supply air fan is smaller. Within the present invention the air fan is selected for only 4800 LPS as compared with the system designed without comfort integration which requires 6000 LPS. This reduces capital cost and running cost. The reduced size of the supply air fan results from the increased temperature difference across the room allowed by ASHRAE 55-1981 and a reduction in the heat transmission to the rooms due to the smaller temperature difference between outside and inside conditions during peak load conditions. In the case of the example shown in Table 1, the difference across the room load ratio line from $[24^{\circ}\text{C}-12.4^{\circ}\text{C}] = 11.6^{\circ}\text{C}$ to $[26^{\circ}\text{C}-12.4^{\circ}\text{C}] = 13.6^{\circ}\text{C}$ reduces the 6000 LPS requirement to $11.6/13.6 \times 6000 = 5118$ LPS.

(b) There is also a reduction in the cooling load. The heat transferred to the perimeter rooms by transmission from the outside is reduced. Conservatively the transmission gains account for 25 per cent of the cooling load and the transmission temperature difference due to the higher 26°C room temperature is reduced by 25 per cent. Thus, (0.25×0.25) or 6.25 per cent of the sensible load is eliminated. Therefore at peak load the volume flow rate can be further reduced to $5118 (1-0.0625) = 4800$ LPS.

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(c) The multizone capability of the VAV system is increased. To indicate how well an air handling unit according to the present invention can accommodate widely diverse zonal loads, consider a multizone unit under simultaneous peak design load conditions. Three zones only are considered for simplicity; a nine zone system with each zone having provision for separate selection of clothing insulation value has recently been designed.

In the earlier comparison of Table 1, to demonstrate the human comfort conditions anticipated by the method of the present invention, the performance of a single zone only was considered. The three operating conditions were presented as if each related to a separate zone serviced by a separate, dedicated air handling unit. However it is the simultaneous design peak load performance which in practice determines the selection of the coil and the fan in an air handling unit designed to service several zones. The simultaneous peak load including all zones is always less than the sum of the individual zonal peak loads and hence smaller components and less energy are required than would be required to satisfy the sum of the maximum loads in each zone, a feature which is already well known to designers. To select the air handling unit we will assume for the purpose of this illustration that the three coil stages listed in Table 1 occur simultaneously and together set the simultaneous peak design load. We also assume that the individual peak load energies, which occur at different times in each of the three zones, are equal. One can visualize that the air handling unit reaches the simultaneous peak load at 4 pm in the afternoon of a midsummer day. Assume on the basis of typical figures for a high rise building that the 100% load stage indicated in Table 1 represents the west zone and that this zone consumes 55 per cent of the total air handling unit energy. The north, south and east facades are combined to form a second zone which at 4 pm is operating at an average of 60 per cent of the maximum load in this second zone, and is found to consume 35 per cent of the air handling unit energy. The interior of the building is the third zone which at the time of the simultaneous peak load is operating at its almost steady state level of ten percent of the air handling unit energy.

In Table 1 it was assumed that the two part-load zones of 65 per cent and 50 per cent occurred on marginal weather days when occupants would be attired with medium clothing. These two part load zones are now considered simultaneously with the peak summer design day and therefore the control system, knowing the time of year and sensing the ambient air temperature, t_{amb} , of 36 °C (see lower left corner of Fig. 8 Control Diagram) establishes the appropriate range of clo values. These are then used to adjust the operative temperature to its optimum value of 24.5 °C to achieve a comfortable environment for the lightly attired occupants of these zones. (In the earlier example the operative temperature for these zones was only 23 °C, the difference being due to the heavier clothing worn by the occupants during the marginal weather season). Table 2 indicates the simultaneous peak performance. The volume flow rate required with Comfort Integration is further reduced to 4136 LPS. For comparison, the LFV-HCV-VAV system without Comfort Integration would require, for the same simultaneous peak design, 4965 LPS of conditioned supply air. The ratio of the two requirements in this case is similar to that found in the Table 1 comparison. It should be stressed that this example is a particular hypothetical case and the numerical values could vary considerably. The following comparison should therefore be treated as being qualitative only:

(a) The reduced peak load means a smaller chiller, cooling tower, piping and ductwork.
 (b) There is an advantage in dehumidifier design. The reduced volume flow rate of the supply air means a smaller face area coil can be used. Alternatively, if peak loads are associated with low sensible heat ratios, as on the Eastern seaboard of the United States and in the tropics, the advantage of a further reduction in face velocity through the larger coil face area can be utilized in the selection for 4136 LPS to give a steeper slope to the coil condition curve and so to increase dehumidification. In this circumstance it is sometimes possible to reduce the number of rows or depth of the coil.

(c) There is a greater flexibility in design. The addition of comfort integration to the system provides a wider range of multizone performance in that each room has its preferred operative temperature and its preferred relative velocity. Thus fewer air handling units may be required.

(d) The "Coanda effect" in slot distribution registers is preserved at low loads. When the VAV system is employed over a range from peak to say 50 per cent of sensible load, there is a danger that the Coanda effect may be lost due to low air flow through the registers, resulting in "dumping" of cold supply air and considerable consequent discomfort. As indicated in Table 1 the volume ratio between the peak and the 50 per cent part load operation is 0.5 for the system without comfort integration, but is 0.64 with comfort integration. A drop from 6000 LPS to 3000 LPS may be a problem. However a drop from 4800 LPS to 3080 is unlikely to disturb the Coanda Effect (see Table 1).

(e) Wasteful use of energy in inefficient fan assisted VAV boxes is eliminated. Fan assisted VAV boxes are used to increase the supply air quantity at low loads to maintain the Coanda effect and to increase air movement and obtain a degree of reheat by blending a proportion of warm return air with the

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conditioned supply air. This design practice increases the cost of the VAV boxes and also increases the operating cost since the small fans are inefficient. Furthermore unfiltered return air can be unhealthy especially if photocopiers or smokers are located in the zone (Fanger, 1987). In the "comfort integrated" system the decreased peak air flow rate coupled with an increased minimum air flow rate eliminates the need for this mostly and inadequate solution.

(f) There is improved ventilation to the air conditioned rooms. This is a side benefit arising from the increase in the supply air volume flow ratio between part load rooms and peak load rooms. Even if conventional VAV systems increase the overall ratio of outside air to return air passing through the air handling unit during marginal weather, the minimum part load rooms will still receive a smaller volume of outside air than do the simultaneously higher part load rooms.

(g) Air conditioning performance is improved over those systems designed to reset their supply air temperatures upwards during marginal weather. In order to increase the supply air volume to low part load rooms, reset of the temperature of the supply air leaving the dehumidifier coil is common. Wherever humidity is a significant factor this is poor practice since the lower part load rooms characteristically have the lower sensible heat ratios and therefore demand more dehumidification. Upward reset of the supply air temperature is associated with a higher surface temperature at the dehumidifier which reduces the dehumidification. Furthermore rooms which experience an increase in load during the period of upward reset may not be able to have them offset. With the comfort integration of the present invention, the supply air temperature remains constant and rooms with very low loads have their operative temperature decreased automatically, with the result that they receive an increased air supply and the required level of dehumidification can be achieved.

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TABLE 1
PROJECTED ZONE PERFORMANCE IN A DESIGN FOR A PERTH, WEST
AUSTRALIA HIGH RISE OFFICE BUILDING

	With Comfort Integration of this Invention	Without Comfort Integration of this Invention
<hr/>		
FULL COIL STAGE		
During 100% load		
Rm dbt 'C*	26°C	24°C
Supply air dbt 'C	12.4	12.4
Rm W g/kg	9.28	9
Rm RH %	44%	48%
Sim. Supply Air LPS	4800	6000
Rm Sens Load lw	79	83
Rm SHR	0.87	0.87
Tot Cooling Capacity kw	110	116
Tot Water LPS	3.6	4.0
<hr/>		
PART COIL STAGE		
65% Load		
Rm dbt 'C*	23	24
Supply Air dbt 'C	12.4	12.4
Rm W g/kg	10.6	10.6
Rm RH %	60%	57%
Supply Air Vol LPS	4000	3900
Rm Sens Load kw	51.0	54.3
Rm SHR	0.65	0.67
Tot. Cooling kw	88.4	90.2
Tot. Water LPS	4.5	4.5
<hr/>		
Peak to 65% Part Load		
Supply Volume RATIO	1.20	1.54
<hr/>		
PART COIL STAGE		
50%		
Rm dbt 'C*	22.8	24
Supply Air dbt 'C	12.4	12.4
Rm W g/kg	11.3	11.5
Rm RH %	64%	61%
Sup Air Vol LPS	3080	3000
Rm Sens Load kw	39.6	42.0
Rm SHR	0.60	0.60
Tot. Cooling kw	7.10	74.9
Tot. Water LPS	2.8	3.0
<hr/>		
Peak to 50% Part Load		
Supply Volume RATIO	1.56	2.00
<hr/>		

* As indicated on Fig. 3 charts it is assumed air dry bulb temperature, t_a = mean radiant temperature, t_r .

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TABLE 2

PROJECTED PERFORMANCE OF AIR HANDLING UNIT AT SIMULTANEOUS PEAK				
	With Comfort Integration		Without Comfort Integration	
	kw	LPS	Kw	LPS
West Zone at 55 per cent of A.H.U. Load	60.5	2640	63.8	3300
East, North & South Zones at 35 per cent of A.H.U. Load	31.0	1232	31.5	1365
Interior Zones at 10 per cent of A.H.U. Load	7.0	264	7.6	300
TOTAL	98.5	4136	102.9	4965

Claims

1. A method of cooling a space by air conditioning said space within a relatively narrow comfort target zone as depicted on a psychrometric type chart, itself generally within a relatively broad standard comfort zone, the factors determining said narrow target zone including the heat transfer resistance of occupants' clothing and level of physical activity, the method comprising:

determining air dry bulb temperature and at least one of mean radiant temperature and operative temperature in said conditioned space, and controlling:

(a) one at least of temperature of supply air to said space, and dry bulb air temperature leaving said space,

(b) effective size of said dehumidifier while maintaining coolant velocity through said dehumidifier to be between the equivalent of 1 and 2.2 metres per second of chilled water, and

(c) humidity ratio in said conditioned space to be between four and thirteen grams of water vapour per kilogram of dry air by varying at least one of leaving temperature of the supply air from, and effective size of and coolant flow velocity in, said dehumidifier.

2. A method according to claim 1 wherein said operative temperature within said conditioned space is controlled by determining said mean radiant and said air dry bulb temperatures and adjusting said air dry bulb temperature to be less than the operative temperature by the same amount as the mean radiant temperature exceeds said operative temperature.

3. A method according to claim 1 wherein said mean radiant temperature within said conditioned space is determined and further comprising controlling temperature of supply air to said conditioned space to be sufficiently cool to offset the sensible heat load and the effect of said mean radiant temperature on the thermal comfort of occupants within said space, and controlling said relative air velocity over occupants to be compatible with the operative temperature required for said thermal comfort.

4. A method according to claim 1 wherein said dehumidifier comprises a plurality of coil portions, a plurality of coil valves interconnecting said coil portions, a plurality of coil bypass tubes, and a throttle valve, said coil portions, coil valves and coil bypass tubes being in a configuration controllable to vary the effective cooling size of said dehumidifier,

said method comprising effecting control of said coil valves to bypass flow selectively from portions of the dehumidifier coil through said coil bypass tubes to reduce the effective cooling capacity of the dehumidifier upon reduction of load, but retain said coolant flow through said coil portions to be the equivalent of between 1 and 2.2 metres per second of coolant.

5. A method according to claim 4 wherein said air conditioner comprises a fan which causes air flow through said dehumidifier, said method comprising limiting said air flow to be sufficiently low that humidity ratio within said conditioned space does not exceed thirteen grams of water per kilogram of dry air, but is not less than four grams per kilogram.

6. A method according to claim 4 wherein said air conditioner comprises a fan which causes air flow through a plurality of rows of said dehumidifier coil, and the configuration of said coil portions is such that said bypass of coil portions is effected while retaining active coil portions over the whole of a path of said

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air flow through said rows of dehumidifier coil.

7. A method according to claim 1 further comprising determining volume flow rate of air through said conditioned space, globe thermometer temperature in relevant portions of said conditioned space, and ambient temperature, computing operative temperature, comparing said computed operative temperature with a temperature in said narrow comfort target zone, and effecting adjustment of one at least of (a), (b) and (c) of the steps of claim 1 as required to maintain said space within said narrow comfort target zone.

8. A method according to claim 1 further comprising determining volume flow rate of air through said conditioned space, globe thermometer temperature in relevant portions of said conditioned space where said globe temperature differs from said air temperature, ambient air temperature, at least one of relative humidity, dew point and humidity ratio in said conditioned space,

computing the thermal energy balance for at least one occupant of said space to determine the equilibrium air temperature at which said occupants would be in thermal equilibrium with the environment of said space, and adjusting said air temperature to said equilibrium value while maintaining at least one of humidity ratio between 4.2 and 12 grams of water per kilogram of dry air and relative humidity between 30 and 60 percent.

9. A method of cooling an air conditioned space comprising:

(a) causing a flow of air through cooling coils of an air conditioner dehumidifier,
 (b) determining at least one of air flow velocity and air volume flow rate,
 (c) sensing dry bulb temperature in said conditioned space and globe thermometer temperature in at least one part of said conditioned space when air and globe temperatures differ therein,
 (d) sensing ambient air temperature,
 (e) providing an electronic controller with input data from (b), (c) and (d) hereof,
 (f) computing with said controller air supply volume and operative temperature and comparing relative air velocity over occupants and said computed operative temperature with a comfort target zone for humans depicting combinations of relative air velocity and operative temperature which have been determined by solution of the thermal energy balance equation which includes heat transfer resistance of occupants clothing and level of physical activity, and the convective, radiative and evaporative exchanges of energy between the occupants and their surroundings,
 (g) adjusting at least one of air supply to said space and supply air temperature to retain said space within said narrow target zone.

10. A method according to claim 1 further comprising effecting said control so that the conditions in said conditioned space require the ratio of air flow in a variable air volume system for fifty percent of the peak sensible heat load to that for said peak sensible heat load to be not less than 0.65.

11. A method according to claim 4 wherein the space is conditioned by a constant air volume system comprising effecting said control by initially maintaining supply air temperature and dehumidifier capacity constant and resetting said air dry bulb temperature in the conditioned space, until the temperature in said conditioned space approaches limits of said narrow comfort zone, and then effecting said control of said coil valves to vary size of said dehumidifier.

12. A method of controlling an air conditioning system, comprising receiving information defining occupant activity, and including:

(a) supply and return air dry bulb temperature,
 (b) at least one of globe temperature and operative temperature,
 (c) at least one of a measure and estimate of relative humidity,
 (d) at least one of supply air volume flow rate and air velocity and available air flow area and a pressure difference, (e) time of day and day of year and date defining:
 (f) the most probable range of clothing worn by occupants of the conditioned space for representative seasonal and ambient conditions,
 (g) the range of insulation values of clothing types,
 (h) the metabolic energy release rate and the external work done for a representative range of activities,
 and selecting appropriate values of metabolic energy release rate, external work output and clothing insulation, computing from a balance between net metabolic heat generation by the occupant and the rate at which it is exchanged with the surroundings within said conditioned space, the change in dry bulb air temperature and relative humidity in said conditioned space necessary to make said rate of heat exchange with the surroundings equal to said net metabolic heat generation by the occupant within a small tolerance range defined by reference to the statistical results of studies of human responses to thermal environments, and
 initiating action to change said air temperature and relative humidity by changing at least one of supply air flow rate and active size of dehumidifier, coolant flow rate, and supply air temperature to maintain the

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conditioned space within said tolerance range.

13. A method according to claim 12 further comprising calculating the change in sensible heat load in the conditioned space due to the changes in the transmitted heat load and changes in the rates of heat removed from equipment and occupants within said space consequent upon said changes in temperature
5 and relative humidity within said space and employing said calculations in determining the optimum strategy by which said changes are effected.

14. A method according to claim 13 further effecting change in relative air velocity to maintain the conditioned space within said tolerance band.

15. A method according to claim 13 further comprising recording both said interrogated and computed data.

16. A method according to claim 13 wherein said computed balance between net metabolic heat generation by the occupant and the rate at which it is exchanged with the surroundings within said conditioned space is computed from the equation derived by P.O. Fanger and known as the comfort equation and published in the ASHRAE Fundamentals Handbook, 1989, and said tolerance in said balance is evaluated from the condition that the quantity known as the Predicted Mean Vote and published in said ASHRAE handbook
15 shall not be less than -0.5 or greater than +0.5.

17. An air conditioner for cooling a conditioned space within a relatively narrow comfort target zone as depicted on a psychrometric type chart, itself generally within a relatively broad standard comfort zone, the factors determining said target zone including the heat transfer resistance of occupants clothing and level of physical activity, comprising:

20 a dehumidifier having a plurality of coil portions, a fan located to propel air flow through said coil portions, temperature sensing means comprising a thermometer arranged to ascertain at least one of mean radiant temperature and operative temperature in said conditioned space, humidity sensing means in said conditioned space, and:

25 (a) air control means controlling relative air velocity within occupied regions of said space to lie between 0.05 and 0.30 metres per second, but said air not to exceed a velocity of three metres per second through a face of an air conditioner dehumidifier,

(b) temperature control means controlling the temperature of supply air to said space, and dry bulb air temperature within said space,

30 (c) coolant control valve means controlling effective size of said dehumidifier while maintaining coolant velocity through said dehumidifier to between the equivalent of 1 and 2.2 metres per second, and

(d) humidity control means coupled to said humidity sensor and to at least one of said temperature control means and coolant control valves to control humidity ratio in said conditioned space to be between four and thirteen grams of water vapour per kilogram of dry air by varying at least one of
35 leaving temperature of the supply air from, effective size of, and coolant flow velocity, said dehumidifier when said humidity ratio approaches said four grams per kilogram.

18. An air conditioner according to claim 17 wherein said temperature sensing means comprise dry bulb thermometers in supply air to and return air from said conditioned space, and further comprising air flow rate sensing means, ambient air temperature sensing means,

40 and an electronic controller interconnecting said sensing means and control means to effect control of said relative air velocity, dry bulb temperature in said space, supply air temperature, effective dehumidifier size and minimum and maximum humidity in said space.

19. An air conditioner according to claim 18 wherein said air control means comprises dampers located between said dehumidifier and said conditioned space, and motors coupled to said dampers to control air
45 flow therethrough, and said electronic controller limits relative air velocity to between 0.05 and 0.30 metres per second through the conditioned space.

20. An air conditioner according to claim 18 wherein said temperature control means comprises said coolant control valve means and said electronic controller varies the number of active coil portions of said dehumidifier to retain coolant velocity through said active coils between 1 and 2.2 metres per second.

50 21. An air conditioner according to claim 18 wherein said controller increases the leaving temperature of the supply air when the humidity ratio drops to four grams of water vapour per kilogram of dry air.

22. An air conditioner according to claim 18 wherein said air control means comprises fan speed control means effected through communication between said air flow control means and said electronic control means..

55 23. An air conditioner according to claim 17 wherein said control means are components of an air handling unit, and said air conditioned space comprises a plurality of separate zones, comprising further said sensing means in each of at least some of said zones, and communication means between said further sensing means and said air handling unit.

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24. An air conditioner according to claim 18 wherein the fan and air control means co-operate to deliver ventilation air to said conditioned space at the rate of not less than 7.5 litres of ventilation air per person said ventilation air being that portion of the supply air drawn from outside the building and mixed with recirculated air prior to its passing through the dehumidifier.

- 5 25. An air conditioner according to claim 13 wherein said electronic controller is programmed to reduce the velocity of air flow through a face of a dehumidifier to not more than 0.5 metres per second and to cause coolant to flow through the tubes of at least part of said dehumidifier at a velocity of not less than 1.0 metres per second and not more than 2.2 metres per second for at least part of a period during which said conditioned space is not occupied, such procedure allowing the humidity ratio of the air to reduce to a
10 minimum value without inhibition and thus to dry all deposits of water from the air distribution system and to reduce the moisture content of the building fabric and furnishings within said conditioned space.

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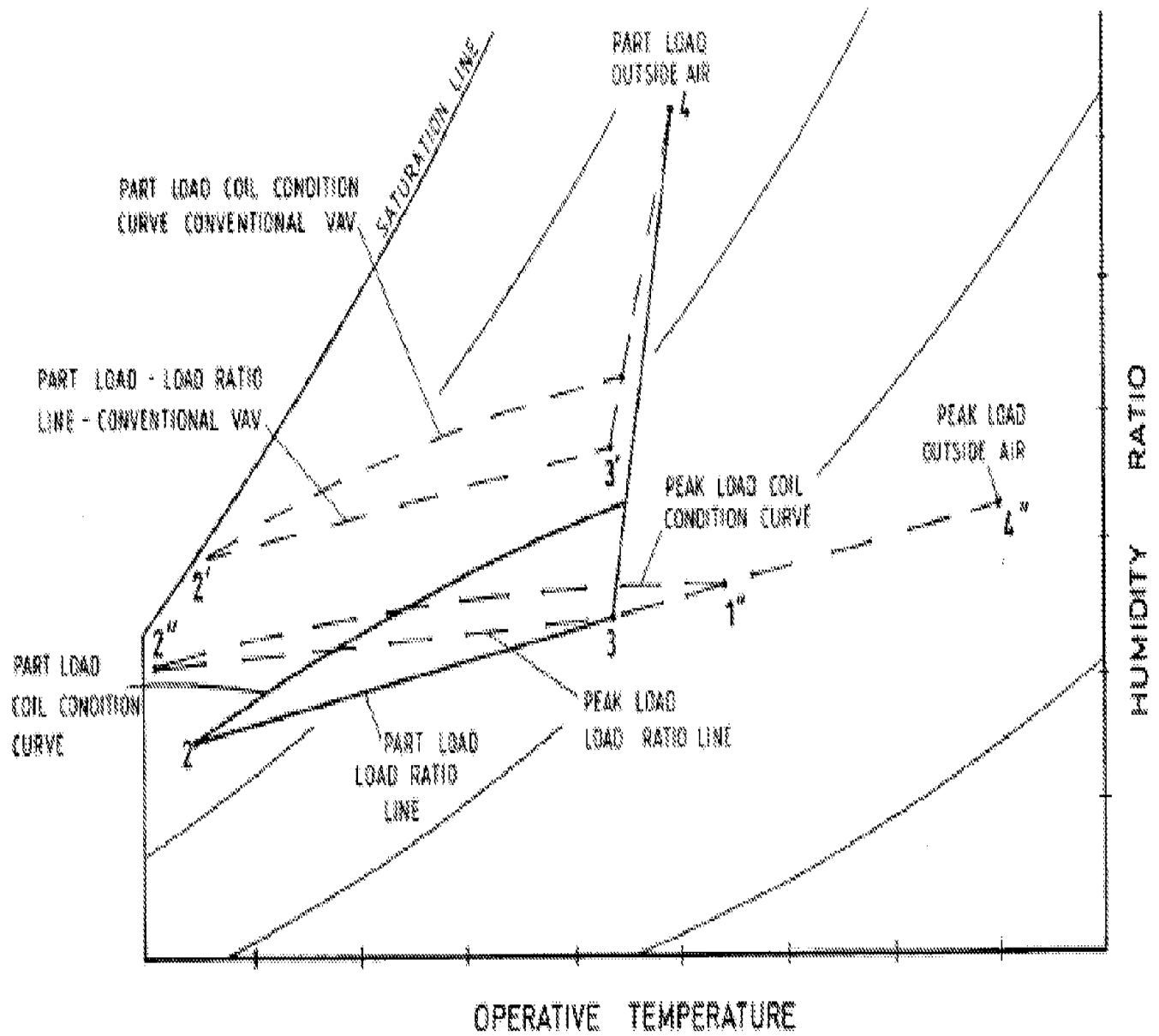
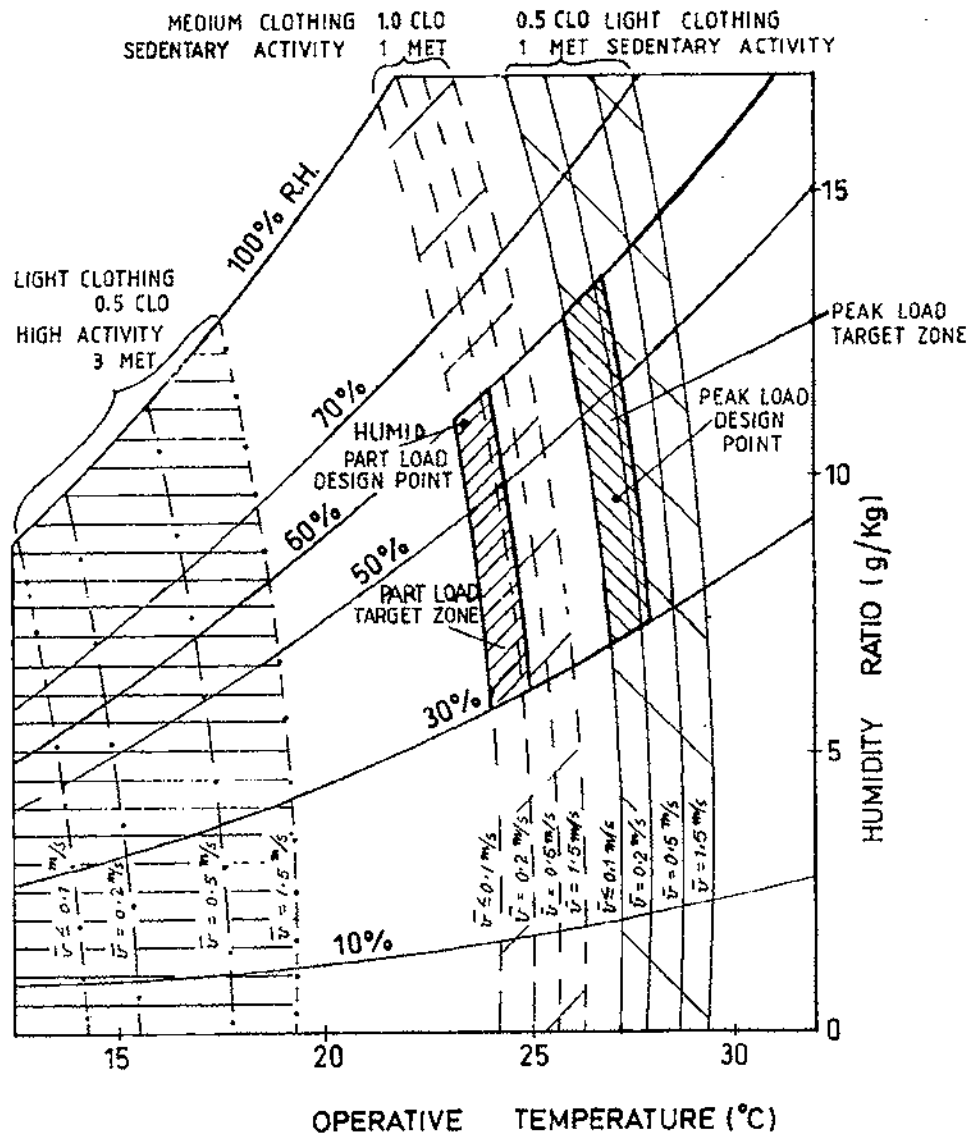
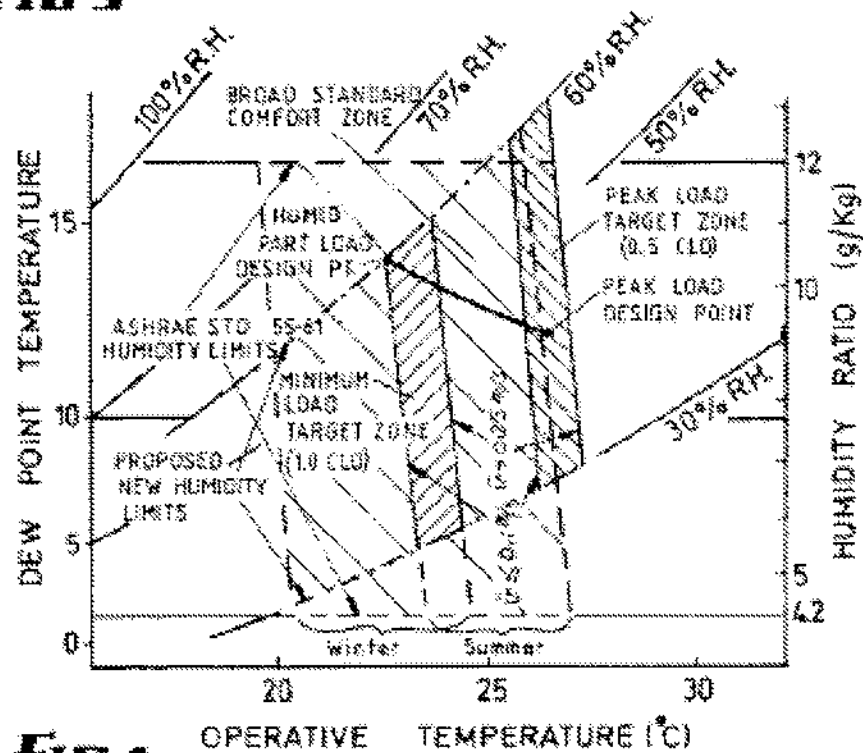
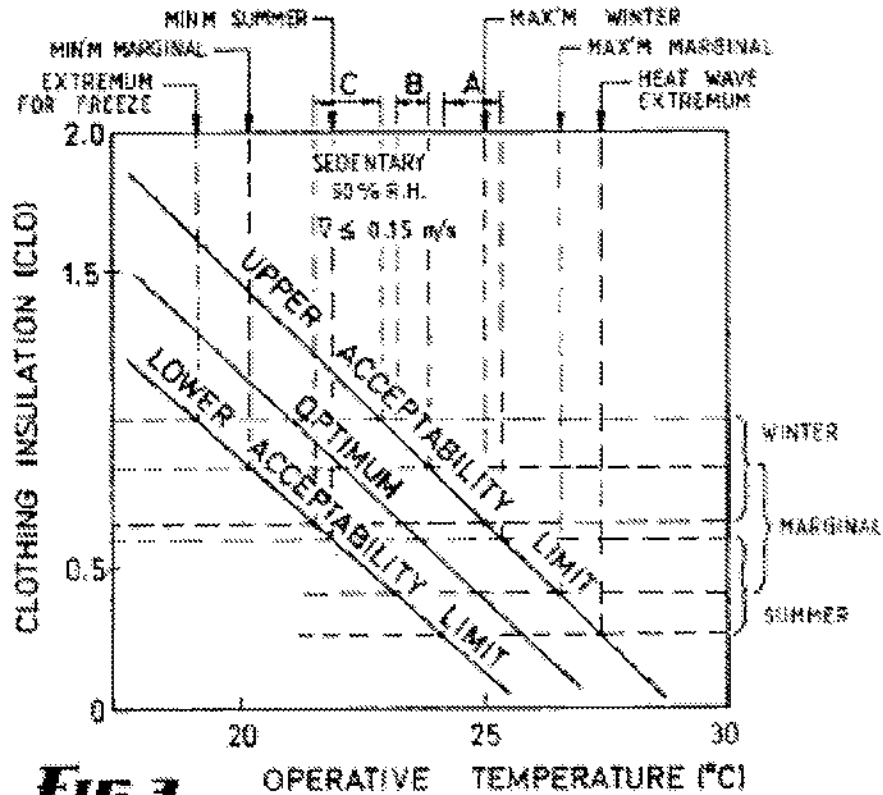


FIG 1

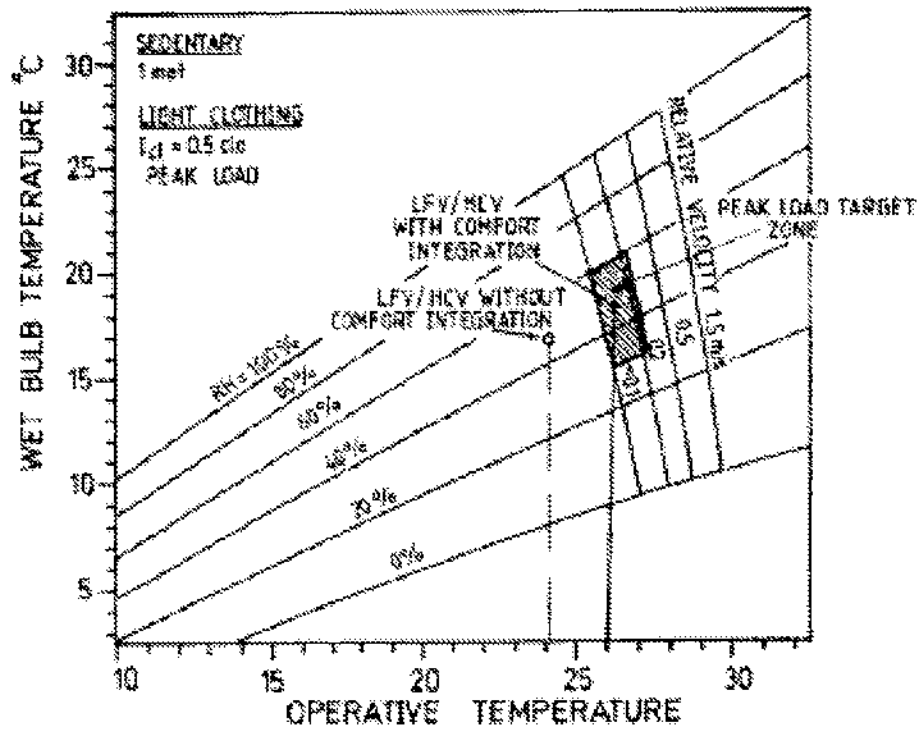
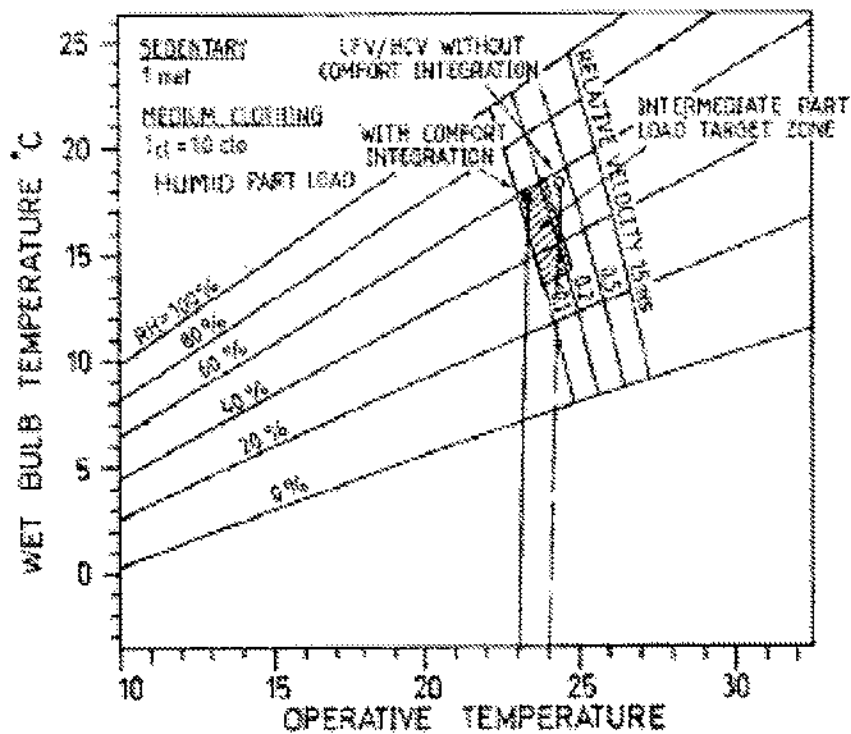
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**FIG 2**

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**FIG 5a****FIG 5b**

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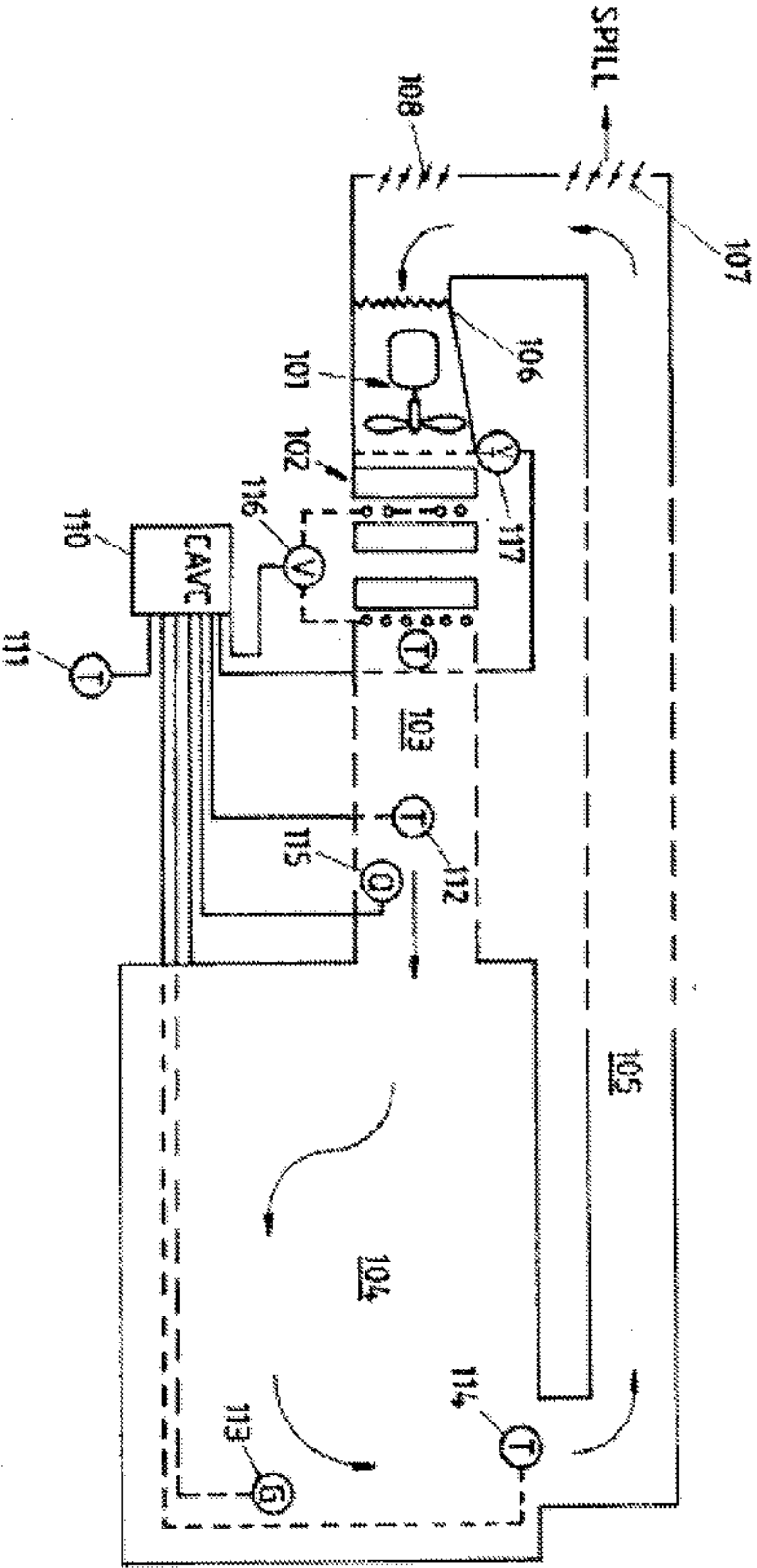
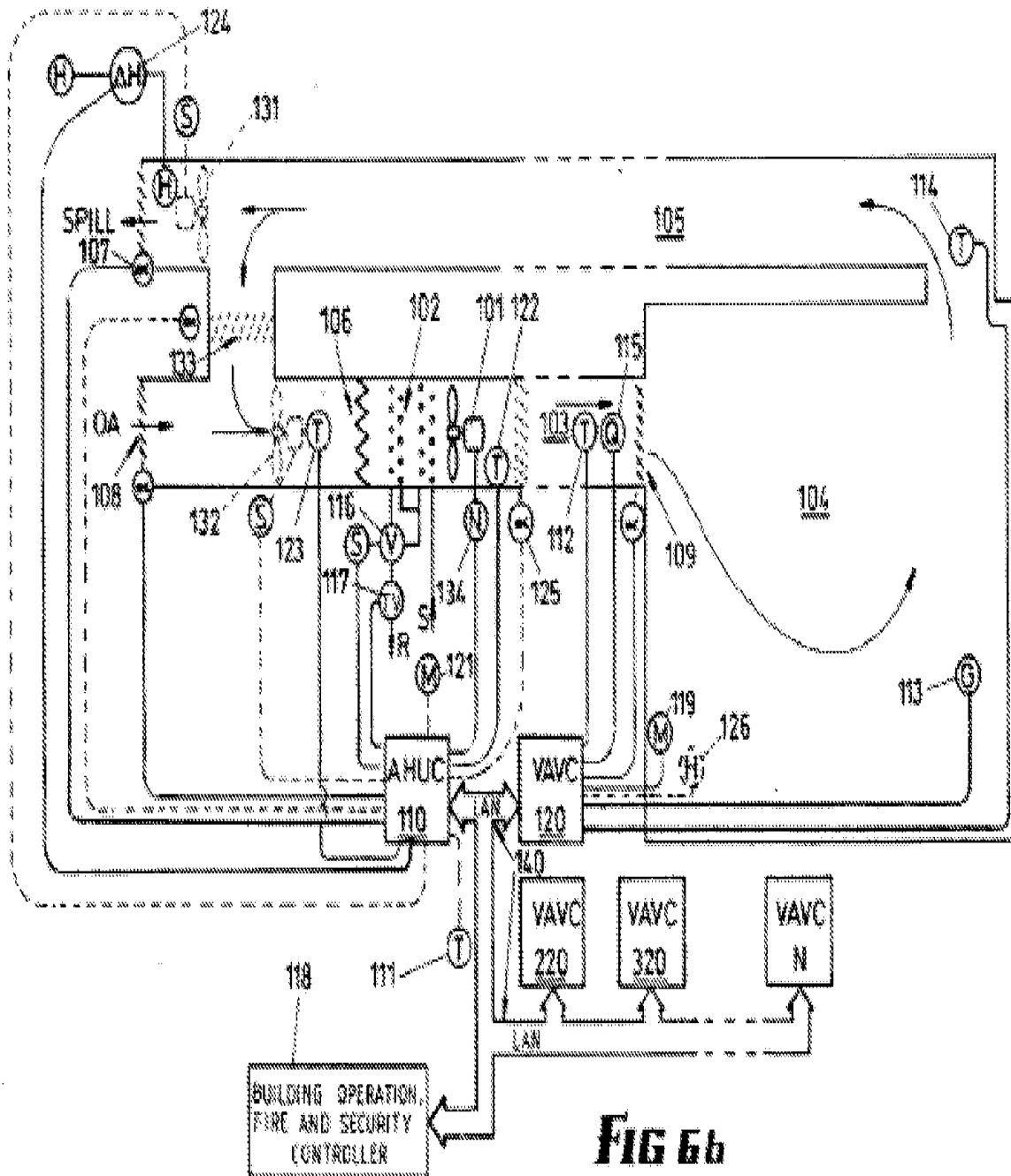


FIG 5a



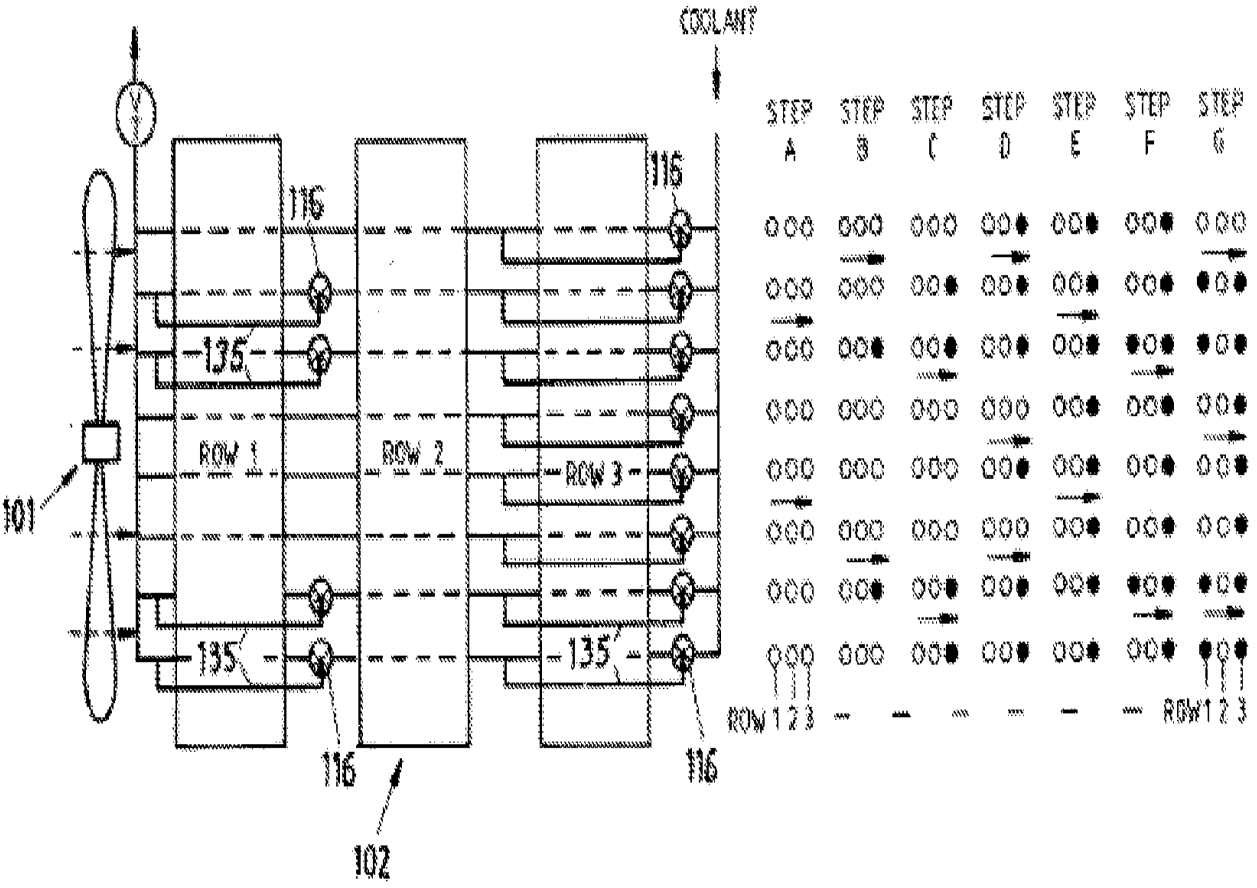


FIG 7

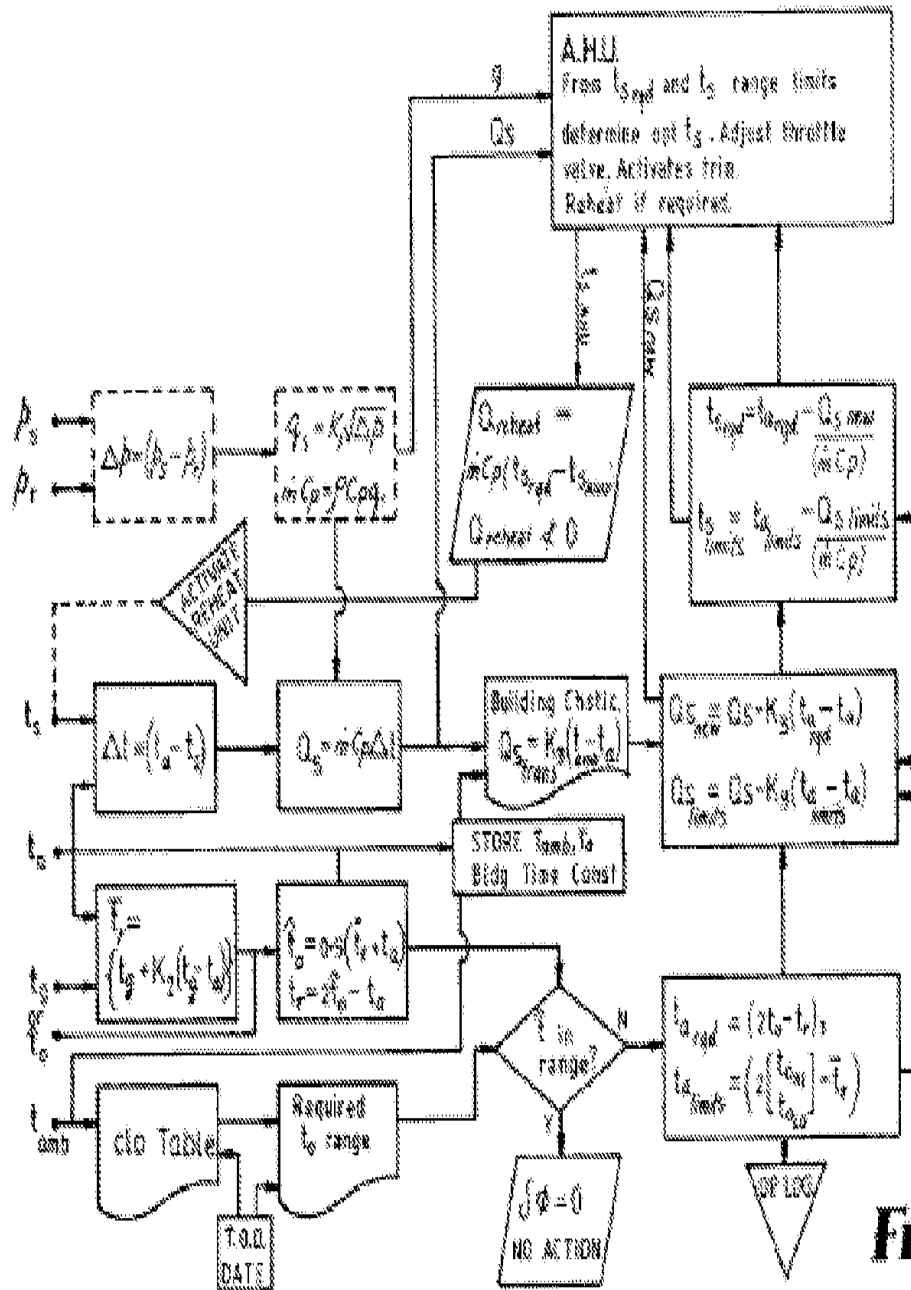
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0386 30



FIG 8

REF ID: A67434



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No.	Drawing	Application No.	Status	Title of Invention	IPC	Applicant	Registration No.	Full Doc	
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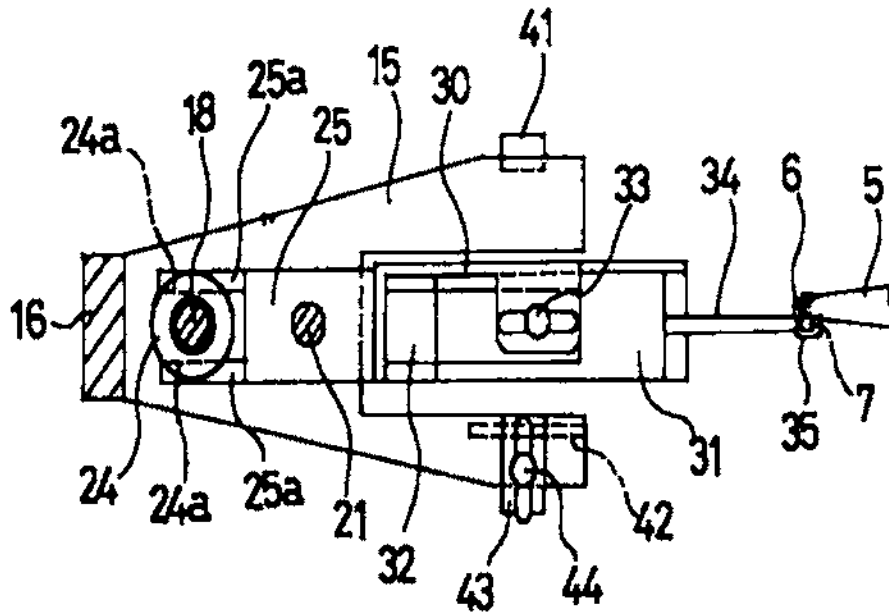
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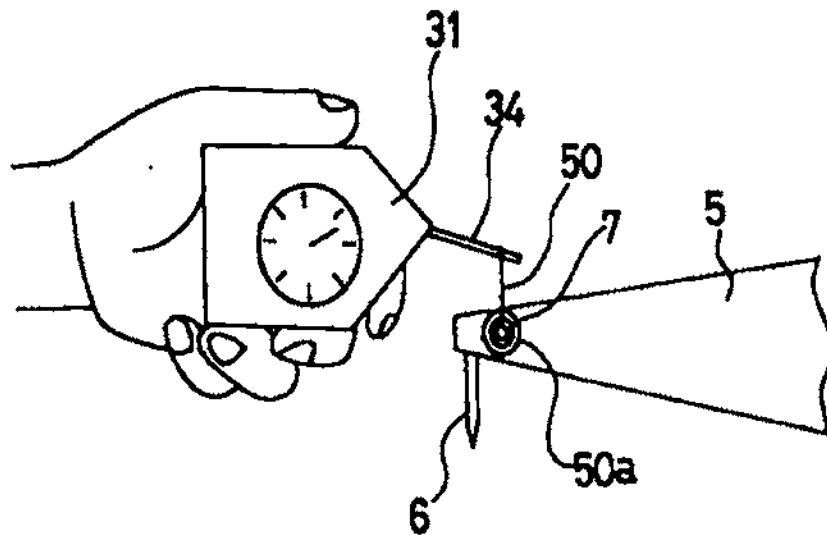
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Electronic Acknowledgement Receipt

EFS ID:	12974392
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Robin Leu
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	08-JUN-2012
Filing Date:	11-MAY-2012
Time Stamp:	18:57:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	EFACT-011C1_rescission.pdf	62564 PZKw5E1f6aHf6Kw4Zs1ff2eH1915Zab6h5	no	2

Warnings:**Information:**

0394

Case 6:20-cv-00078-ADA Document 60-2 Filed 04/29/21 Page 1617 of 2039

2	Power of Attorney	EFACT-011C1_poa.pdf	53455 19868044345542911a02731621d075a87c0b1c118	no	1
Warnings:					
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3	Assignee showing of ownership per 37 CFR 3.73(b).	EFACT-011C1_stmnt373.pdf	37727 9127a97b925d1a8e15b2279a11a85591001c95d0	no	1
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4		EFACT-011C1_ids.pdf	350253 e20a02a06ca0b094e3c3d6cc020d1c887c0e01a1	yes	6
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New International Application Filed with the USPTO as a Receiving Office

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Docket No.: EFACT.011C1

Customer No. 20,995

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	John Douglas Steinberg
App. No.	:	13/470,074
Filed	:	May 11, 2012
For	:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	:	Unknown
Group Art Unit	:	3744
Conf. No.	:	4061

RESCISSION OF ANY PRIOR DISCLAIMERS AND REQUEST TO REVISIT ART

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The claims of the present application are different and possibly broader in scope than any pending claims in any related application or issued claims in any related patent. In particular, in the parent application, U.S. Patent Application No. 12/502,064, Applicant amended claims and/or presented arguments in view of at least U.S. Patent No. 5,977,964; U.S. Publication No. 2008/0281472; article "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings" by Wang, et al. and manuals from Johnson Controls (T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3) and Emerson Climate Technologies (Network Thermostat for E2 Building Controller Installation and Operation Manual 2007)

To the extent that any amendments or characterizations of the scope of any claim or referenced art could be construed as a disclaimer of any subject matter supported by the present disclosure, Applicant hereby rescinds and retracts such

Appl. No.: 13/470,074
Filed : May 11, 2012

Docket No. EFACT.011C1
Customer No. 20,995

disclaimer. Accordingly, the above-listed references, or other listed or referenced art may need to be re-visited.

In addition, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 6-8-2012

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

13419150:ad
060812

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-873						Application or Docket Number 13470074	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASE FEE (37 CFR 1.101(a), (b), or (c))	N/A	N/A	N/A	95		N/A	
SEARCH FEE (37 CFR 1.101(a), (b), or (c))	N/A	N/A	N/A	310		N/A	
EXAMINATION FEE (37 CFR 1.102(a), (b), or (c))	N/A	N/A	N/A	125		N/A	
TOTAL CLAIMS (37 CFR 1.101)	18	minus 10*	7	30	0.00		
INDEPENDENT CLAIMS (37 CFR 1.101)	2	minus 1*	1	125	0.00		
APPLICATION SIZE FEE (37 CFR 1.101(a))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(C) and 37 CFR 1.101(g).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.102)				0.00			
			TOTAL	530		TOTAL	
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
CLASS PRESENTING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Topic (37 CFR 1.102)	Topic	**	x	x	x	x	x
Independent (37 CFR 1.102)	Topic	***	x	x	x	x	x
Application Size Fee (37 CFR 1.101(g))							
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)							
			TOTAL ADD'L FEE		TOTAL ADD'L FEE		
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
CLASS PRESENTING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Topic (37 CFR 1.102)	Topic	**	x	x	x	x	x
Independent (37 CFR 1.102)	Topic	***	x	x	x	x	x
Application Size Fee (37 CFR 1.101(g))							
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.102)							
			TOTAL ADD'L FEE		TOTAL ADD'L FEE		

* If the difference in column 1 is less than zero, enter "0" in column 2.

** If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/470,074	05/11/2012	3744	530	EEFACT011C1	18	2

CONFIRMATION NO. 4061

FILING RECEIPT



0000000054435977

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 05/25/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

John Douglas Steinberg, Millbrae, CA;

Assignment For Published Patent Application

ECOFACOR, INC., Millbrae, CA

Power of Attorney: None**Domestic Priority data as claimed by applicant**

This application is a CON of 12/502,064 07/13/2009 PAT 8180492
 which claims benefit of 61/134,714 07/14/2008

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

If Required, Foreign Filing License Granted: 05/23/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/470,074**

Projected Publication Date: 08/30/2012

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Preliminary Class

236

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C1
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

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Prefix	Given Name	Middle Name	Family Name	Suffix
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Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Milbrae	State/Province	CA	Country of Residence:
		US		
Citizenship under 37 CFR 1.41(b) i				
US				
Mailing Address of Applicant:				
Address 1		873 Hacienda Way		
Address 2				
City	Milbrae	State/Province	CA	
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Application Information:

Title of the Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Attorney Docket Number	EFACT.011C1	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)	Sub Class (if any)		
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	8	0403	Suggested Figure for Publication (if any)

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.011C1
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

Publication Information:
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12/502064	2009-07-13
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12/502064	non provisional of	61/134714	2008-07-14
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Application Number	Country i	Parent Filing Date (YYYY-MM-DD)
		<input type="radio"/> Yes <input checked="" type="radio"/> No
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EFACT.01101
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

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Assignee 1

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If the Assignee is an Organization check here. ☒

Organization Name EcoFactor, Inc.

Mailing Address Information:

Address 1 423 Broadway, #801

Address 2

City Millbrook

State/Province

CA

Country ¹ US

Postal Code

94030

Phone Number

Fax Number

Email Address

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Signature	John R. King/		Date (YYYY-MM-DD)	2012-05-11
First Name	John	Last Name	King	Registration Number
				34362

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EFACT.011C1

PATENT

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 12/502,064, filed July 13, 2009, which claims priority to U.S. Provisional Application No. 61/134,714, filed July 14, 2008, the entireties of both of which are incorporated herein by reference and are to be considered part of this specification.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

[0003] Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

[0004] These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

[0005] Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

[0006] A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals - ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can shift between multiple present temperatures at different times without real-time involvement of a human being.

[0007] Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at +/- 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

[0008] As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint - that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

[0009] In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by those systems. Hotel guests often turn the air conditioner to a low temperature setting and then leave the room for hours at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system. Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor

detects motion (which is assumed to coincide with the return of the guest), the HVAC system resets to the guest's chosen setting.

[0010] Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

[0011] It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

SUMMARY OF THE INVENTION

[0012] In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with one or more computers or other

consumer electronic devices which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the thermostats to their HVAC systems. The server also monitors and logs activity on the computers or other consumer electronic devices associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

[0013] At least one embodiment of the invention comprises the steps of determining whether one or more networked electronic devices inside a structure are in use; determining whether said use of said networked electronic devices indicates occupancy of said structure; and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

[0014] At least one embodiment of the invention comprises at least one said thermostat having at least one temperature setting associated with the presence of one or more occupants in said structure, and at least one temperature setting associated with the absence of occupants in said structure; one or more electronic devices having at least a user interface; where said electronic devices and said thermostat are connected to a network; where said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

[0016] Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

[0017] Figure 3 shows an embodiment of the website to be used as part of the subject invention.

[0018] Figure 4 shows a high-level schematic of the thermostat used as part of the subject invention.

[0019] Figure 5 shows one embodiment of the database structure used as part of the subject invention.

[0020] Figure 6 shows the browser as seen on the display of the computer used as part of the subject invention.

[0021] Figure 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

[0022] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Figure 1 shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

[0024] Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

[0025] When a user of the subject invention wishes to access information on network 102, the buyer initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn,

establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

[0026] One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

[0027] The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

[0028] In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

[0029] In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

[0030] Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Computers 104 can also be microprocessor- controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

[0031] Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices. The storage medium may comprise any method of storing information. It may comprise random access

memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data. Computers 104 and 106 may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like. Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

[0032] **Figure 2** illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 112 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served as web pages and viewed by computers 104, as well as databases containing information used by the servers.

[0033] In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in **Figure 3**. Those components may include a means to enter temperature settings 202, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

[0034] **Figure 4** shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254,

memory 256, a display 258, a power source 260, a relay 262, which turns the HVAC system on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

[0035] The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

[0036] The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of the home, the solar orientation of the home, the location of the thermostat in the home, the user's preferred temperature settings, whether the user is a participant in a demand reduction program, etc.

[0037] As shown in Figure 3, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow

changing the settings of the temperature for all periods with a single gesture such as a mouse click.

[0038] **Figure 6** represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "No" button 1206. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

[0039] **Figure 7** represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 300 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccupied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under

such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate. If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

[0040] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system. In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's

programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you. Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

[0041] In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

WHAT IS CLAIMED IS:

1. A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated with said structure deemed to be occupied;

monitoring an activity status of at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

determining whether a current HVAC temperature setpoint associated with said HVAC system is set to said first HVAC temperature setpoint or said second temperature setpoint;

determining that said one or more users of said wireless device has previously indicated a preference that said user's input be obtained before automatically changing said current HVAC temperature setpoint in response to said activity status;

prompting said one or more users based on said determining that said one or more of said user's input should be obtained, wherein said prompting sends a message to said wireless device recommending a change to said current HVAC temperature setpoint for said HVAC system;

in response to said prompting, receiving input from said one or more users; and

keeping said current HVAC temperature setpoint based upon said input from said one or more users.

2. The method of Claim 1 wherein said wireless device is a remote control.

3. The method of Claim 1 wherein said wireless device is a wireless phone.

4. The method of Claim 3 wherein said wireless phone is connected to a cellular network.

5. The method of Claim 1 wherein said wireless device is used to determine which occupant of said structure is likely to be present, and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said wireless device.

6. The method of Claim 1 wherein said first and second HVAC temperature setpoints are stored in a database associated with a remote server .

7. The method of Claim 1 in which said wireless device communicates with a remote server.

8. The method of Claim 1 further comprising adjusting said current HVAC temperature setpoint with a remote computer.

9. The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

10. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the existence of occupants in said structure;

at least one wireless device associated with one or more occupants of said structure, wherein said wireless device comprises a graphic user interface, wherein use of said wireless device comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of said wireless device;

an application comprising one or more computer processors that receives data regarding an activity status of said wireless device and whether

said thermostat is set to said first temperature setpoint that indicates said structure is not occupied,

said application determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing a current HVAC temperature setpoint in response to said activity status of said wireless device;

said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained,

wherein said application provides electronic notice to one or more of said users of said wireless device that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint; and

wherein said application in response to said prompting, receives input from said one or more users; and

wherein said current temperature setpoint is set based upon said input from said one or more users.

11. The system of Claim 10 wherein said wireless device is a remote controller.

12. The system of Claim 10 wherein said wireless device is a wireless phone.

13. The system of Claim 12 wherein said wireless phone is connected to a cellular network.

14. The system of Claim 10 said wireless device is used to determine which occupant of said structure is likely to be using at least one of said electronic devices, and said second temperature setpoint is selected based upon the preferences of the occupant determined to be using said at least one electronic device.

15. The system of Claim 10 wherein said first and second temperature setpoints are stored in a database associated with a remote server.

16. The system of Claim 10 wherein said wireless device communicates with a remote server.

17. The system of Claim 10 further comprising a remote computer that varies said first temperature setpoint.

18. The system of Claim 10 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

ABSTRACT OF THE DISCLOSURE

The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

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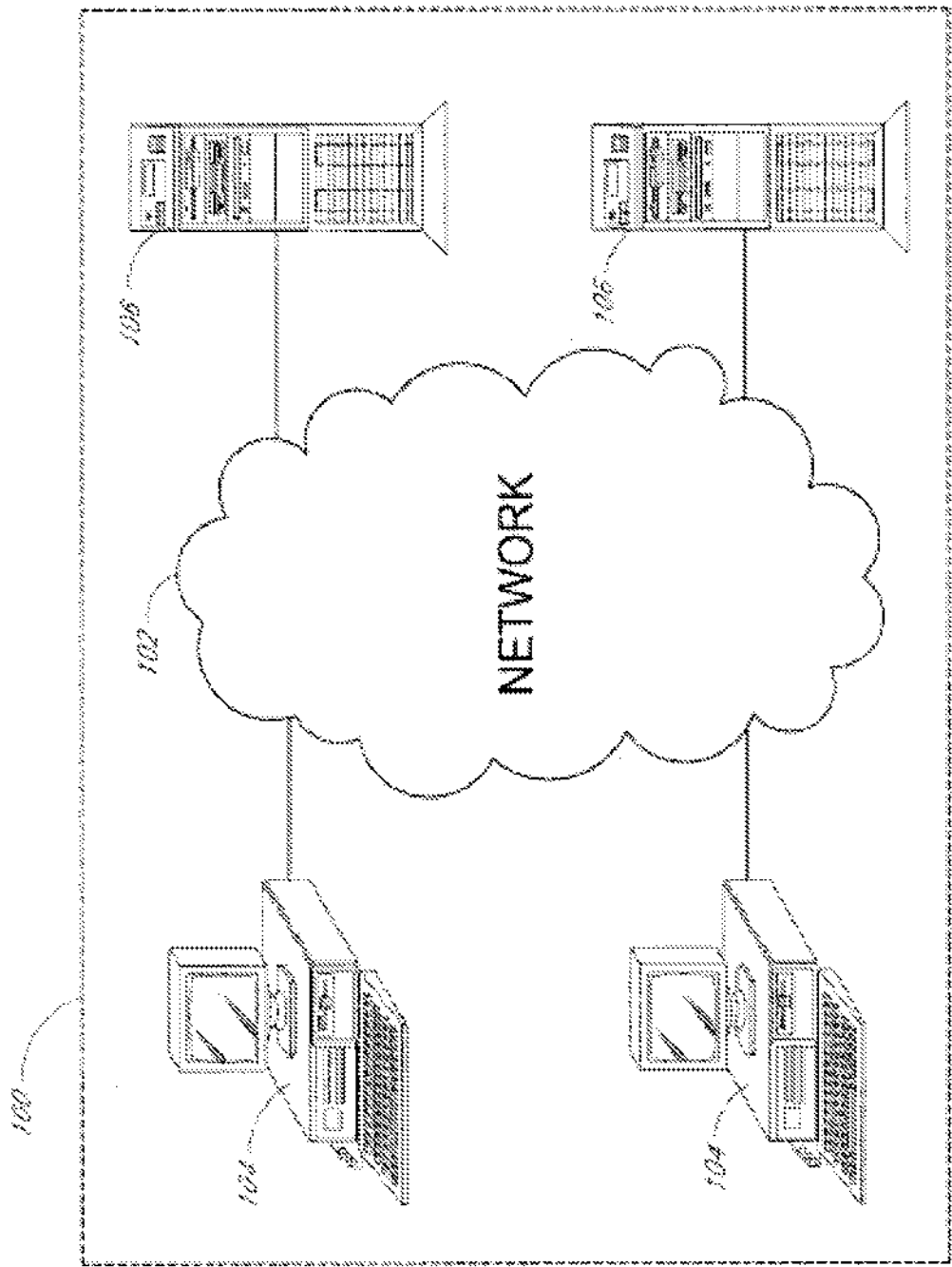
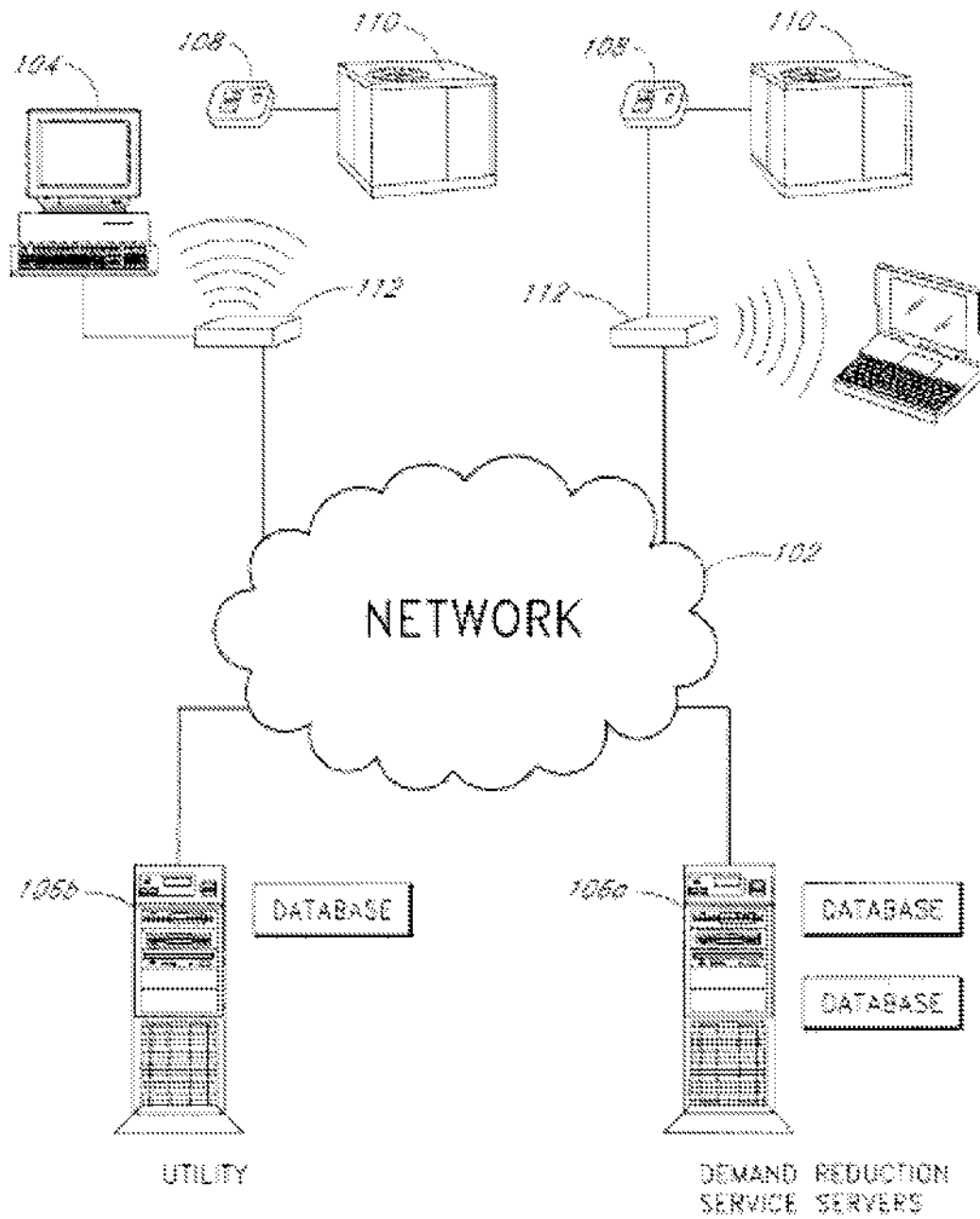


FIG. 1

2/8

*FIG. 2*

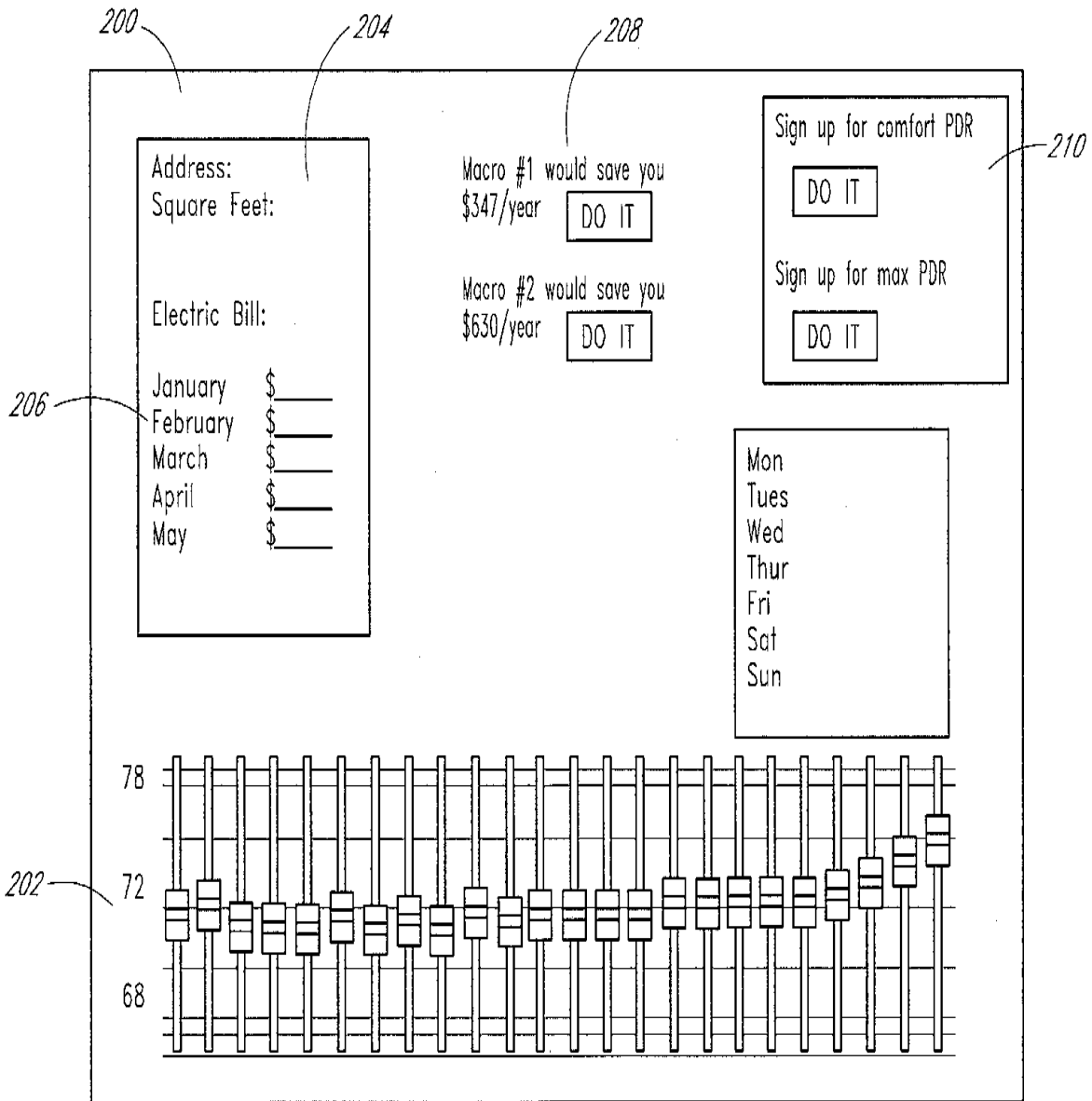


FIG. 3

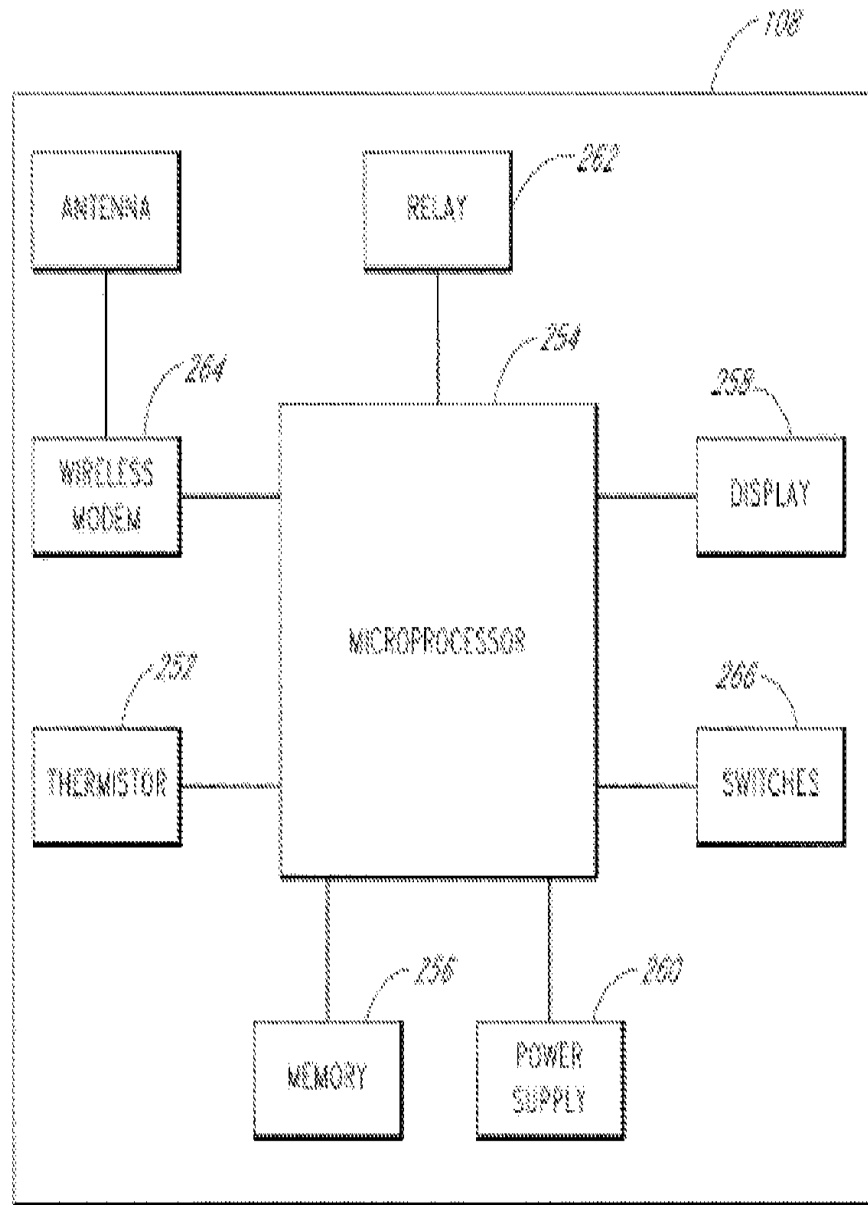


FIG. 4

5/6

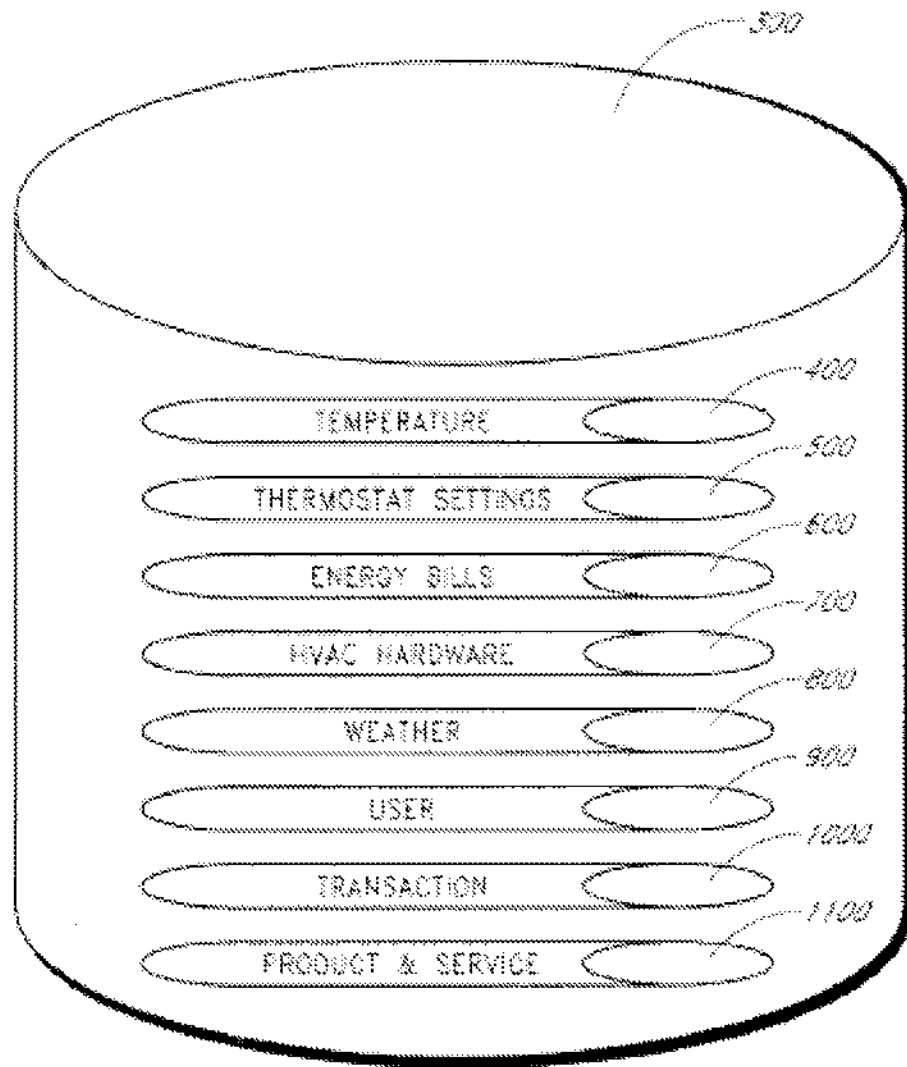


FIG. 5

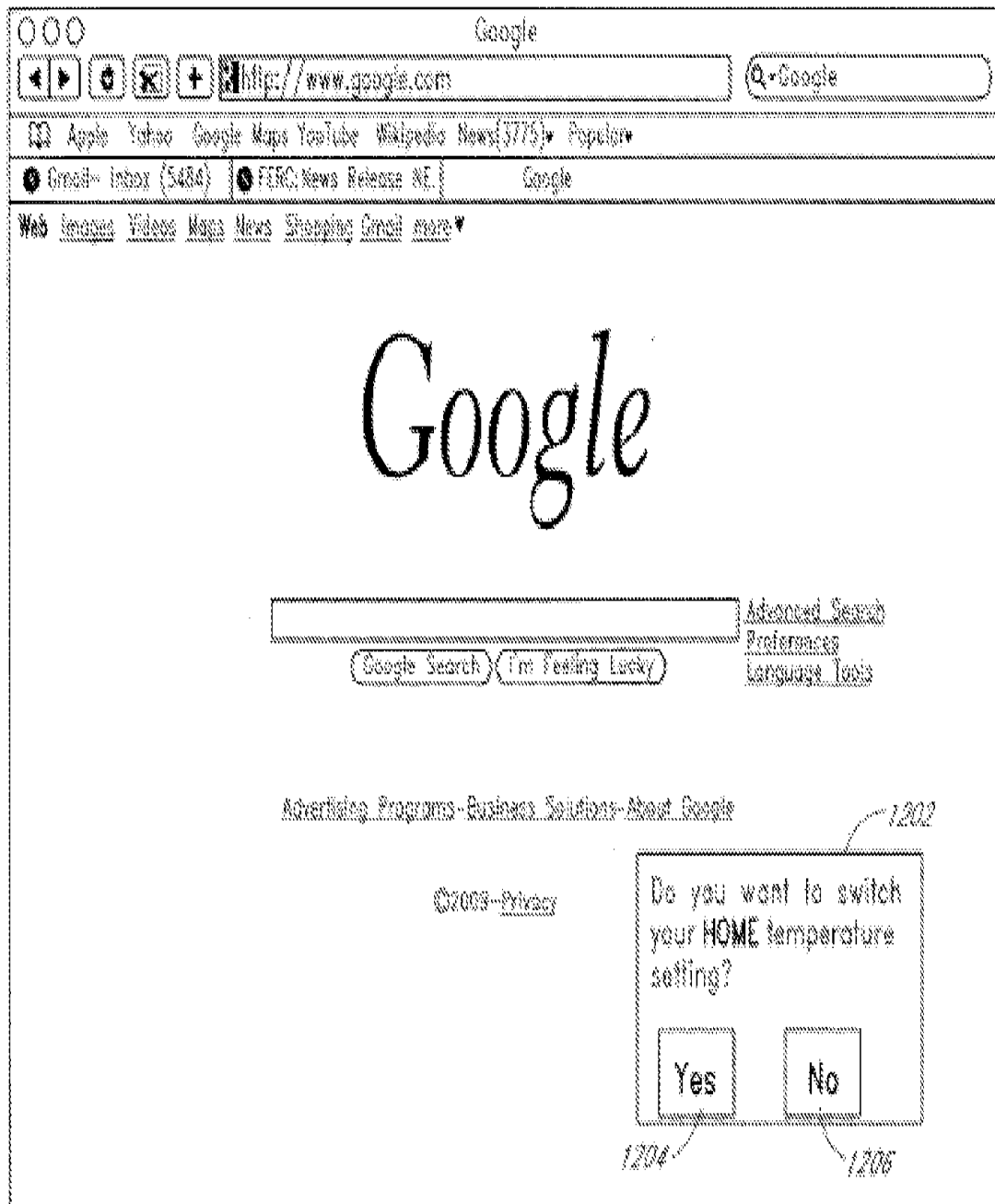
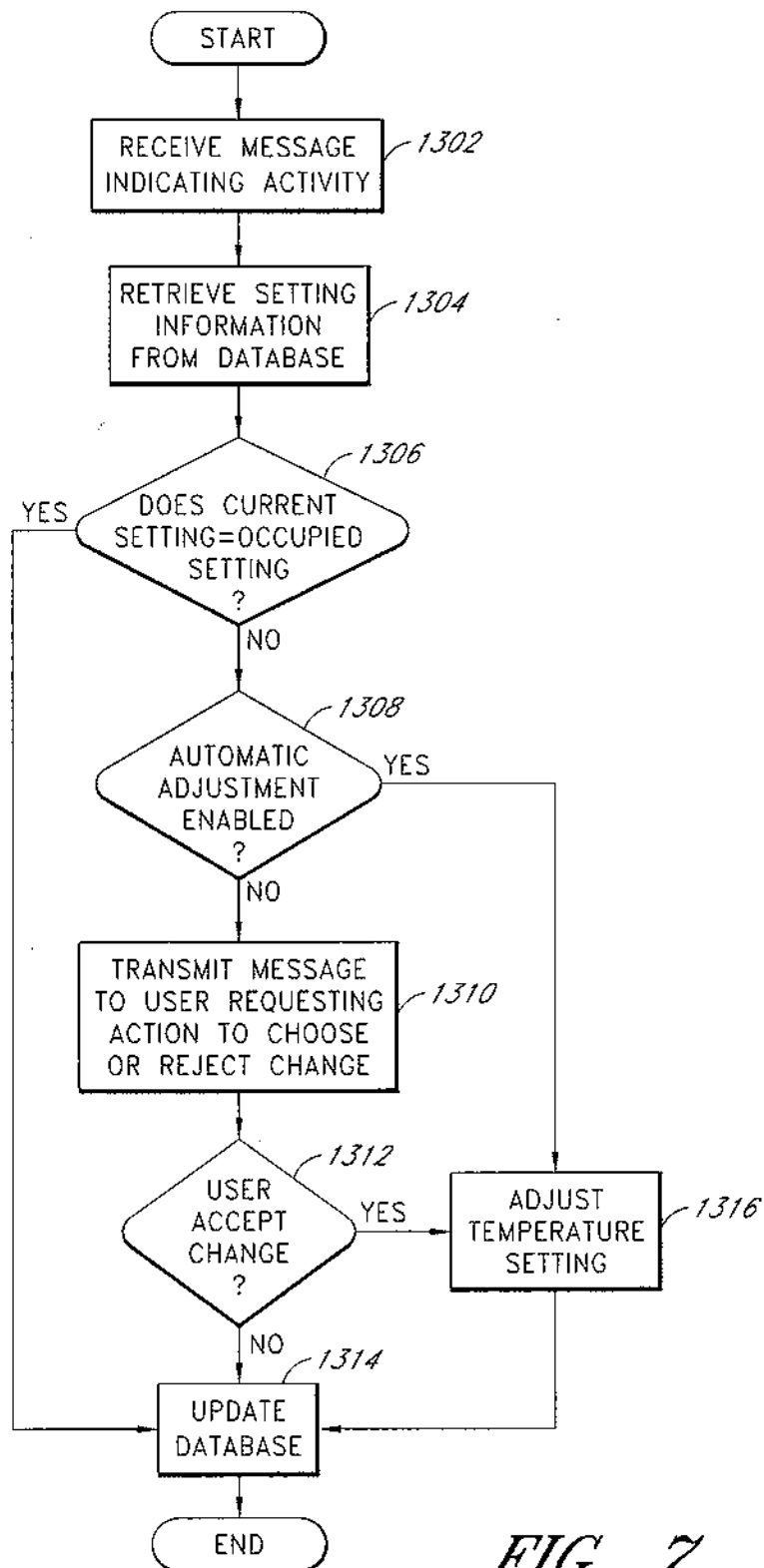
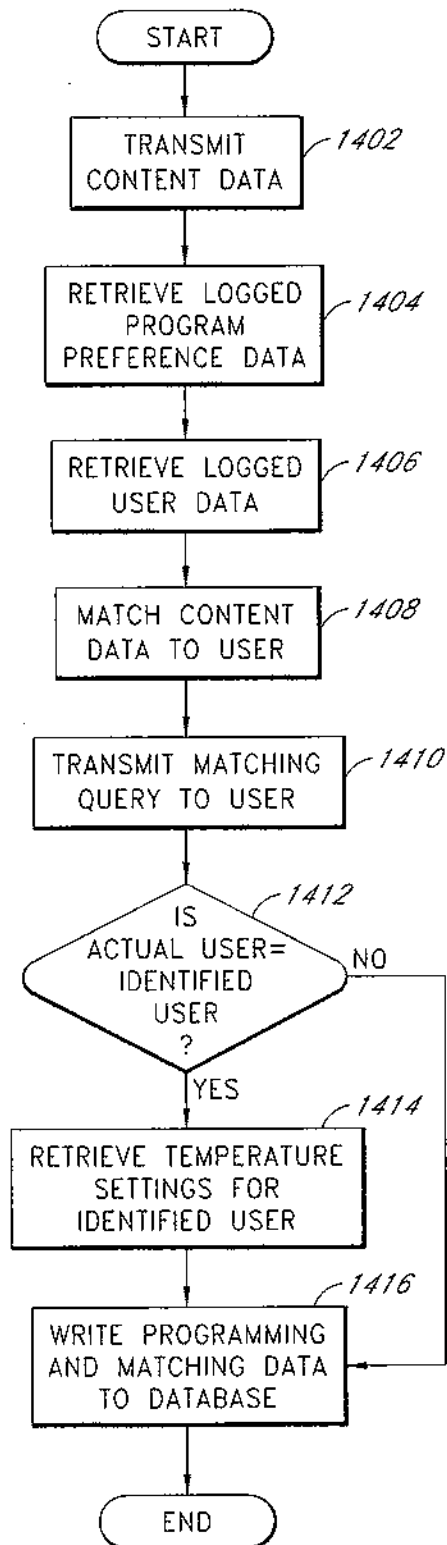


FIG. 6

7/8

*FIG. 7*

8/8

*FIG. 8*

**DECLARATION FOR UTILITY OR DESIGN APPLICATION
UNDER 37 CFR 1.63**

Docket No.: JSTEIN.011A

Page 1 of 1

Title: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE
AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Inventors: John Douglas Steinberg

Please Direct All Correspondence to Customer Number 20,995

This Declaration is directed to the invention that:

Was filed as Serial No. 12/502,064 filed on July 13, 2009

As a below named inventor:

I believe the inventor named below to be the original and first inventor of the subject matter which is described and claimed and for which a patent is sought;

I have reviewed and understand the contents of the above-identified application, including the claims, and any amendment filed herewith or identified above;

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56;

The application was originally filed with an Application Data Sheet (ADS). The ADS sets forth any applicable Foreign Priority Claims under 35 USC § 119, and sets forth the full mailing and residence address of each inventor whose signature appears below as allowed under 37 CFR 1.63(c). The ADS also sets forth any Domestic Priority Claims under 35 USC §§ 119(e), 120, 121, and 365.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor: John Douglas Steinberg

Signature:

Citizenship:

United States

Date: 9/23/09

Send Correspondence To:
KNOBBE, MARTENS, OLSON & BEAR, LLP
Customer No. 20,995

7845463:ad/092309

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011C1			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	95	95
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				530

Electronic Acknowledgement Receipt

EFS ID:	12762392
Application Number:	13470074
International Application Number:	
Confirmation Number:	4061
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Sabrina Jacob
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011C1
Receipt Date:	11-MAY-2012
Filing Date:	
Time Stamp:	18:23:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$530
RAM confirmation Number	5185
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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Case 6:20-cv-00078-ADA Document 69-2 Filed 04/29/21 Page 1658 of 2039

1	Application Data Sheet	EFACT-011C1_ADS.pdf	1023445 8c75200fa0828d187c3f6a6957d779083e1a08f	no	4
Warnings:					
Information:					
2		EFACT-011C1_specification.pdf	835922 51d9b65216c13ed6790a5ba84a00517c7f30f	yes	17
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	12	
	Claims		13	16	
	Abstract		17	17	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	EFACT-011C1_drwgs.pdf	142456 212f46ee5f57a282f86b1119e402045221a83982	no	8
Warnings:					
Information:					
4	Oath or Declaration filed	EFACT-011C1_declaration.pdf	57003 92ba07e97e041665948111806128096ccc436c77	no	1
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	33001 1a82e5a2c6d1e7a75a9c53a365d84e53b0a1d	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2091827		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY DOCKET NO./TITLE	REQUEST ID
12/502,064	07/13/2009	John Douglas Steinberg	EFACT011A	09798

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 11/14/2019 has been accepted.

CERTIFICATIONS:**Change of Entity Status:**

☒ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/John R. King/
Name:	John R. King
Registration Number:	34362



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	05/15/2012	8180492	EEACT.011A	5514

20995 7590 04/25/2012
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
 (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

John Douglas Steinberg, Millbrae, CA;

Receipt date: 12/18/2009

12502084 - GAU: 2121

PTD/SB/GB Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i> SHEET 2 OF 4	Application No.	12/502084
	Filing Date	07-13-2007
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3044
	Examiner	
	Attorney Docket No.	ASTEEN-011A

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,695,218	02-24-2004	Fleckenstein	
	31	6,726,113	04-27-2004	Guo	
	32	6,731,992	06-04-2004	Ziegler	
	33	6,734,606	05-11-2004	Cratsley	
	34	6,772,062	08-03-2004	Amundsen	
	35	6,785,592	08-31-2004	Smith	
	36	6,785,630	08-31-2004	Kokk	
	37	6,789,739	09-14-2004	Howard Rosen	
	38	6,853,980	02-08-2005	Ikeda, et al.	
	39	6,868,293	03-15-2005	Schurt	
	40	6,868,319	03-15-2005	Kipersztok, et al.	
	41	6,882,712	04-19-2005	Iggulden, et al.	
	42	6,889,908	05-10-2005	Crippes, et al.	
5-10-2005	43	6,891,538	10-10-2005	Petite, et al.	
	44	6,991,029	01-31-2006	Orfield, et al.	
	45	7,009,493	03-07-2006	Howard	
	46	7,031,600	04-18-2006	Seem, et al.	
	47	7,039,502	05-02-2006	Hunter	
Changes applied to document, LAS, 4/4/2012	48	7,089,068	08-08-2006	Terry, et al.	
	49	7,130,719	10-31-2006	Ehlers, et al.	
	50	7,130,832	10-31-2006	Bannai, et al.	
	51	7,167,079	01-23-2007	Smyth, et al.	
	52	7,167,986	03-06-2007	Johnson, et al.	
	53	7,205,692	04-17-2007	Luebke, et al.	
	54	7,215,746	05-08-2007	Iggulden, et al.	
	55	7,216,015	05-08-2007	Pohl, Robert J.	
	56	7,231,424	06-11-2007	Bodin, et al.	
	57	7,232,075	06-19-2007	Flecken	
	58	2003/0040934 A1	02-27-2003	Skidmore, et al.	

Examiner Signature

Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T* - Place a check mark in this column if a citation is greater than 10 years old. ALL REFERENCES CONSIDERED BY EXPT. WERE LINED THROUGH. /DCR/



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	EFACT.011A	5514

7590 04/19/2012
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

EXAMINER

ROBERTSON, DAVID

ART UNIT	PAPER NUMBER
----------	--------------

2127

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

04/19/2012

ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 4-16-12 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

- ☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).
- ☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).
- ☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

571-272-4200 or 1-888-786-0101
 Application Assistance Unit
 Office of Data Management

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
 Commissioner for Patents
 P.O. Box 1450
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 or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

20995 7590 03/20/2012
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 IRVINE, CA 92614

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	RFAC1.011A	5514

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$0	\$0	\$870	06/20/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
ROBERTSON, DAVID	2121	700-276000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

- 1 **Knobbe, Martens,**
 2 **Olson & Bear, LLP**
 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

EcoFactor, Inc.

Millbrae, CA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s); any deficiency, or credit any overpayment, to Deposit Account Number 11-1410 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

John R. King
 John R. King

Date

4-16-2012

Typed or printed name

Registration No.

34,362

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Docket No.: EFACT.011A

Customer No. 20,995

TRANSMITTAL OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Applicant : John Douglas Steinberg
App. No : 12/502,064
Filed : July 13, 2009
For : SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC
DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY
MANAGEMENT SYSTEM
Examiner : David Robertson
Art Unit : 2121
Conf No. : 5514

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Supplemental Information Disclosure Statement is being filed to submit the enclosed PTO/SB/08 Equivalent listing five (5) references, two of which are enclosed/attached.

Pursuant to 37 C.F.R § 1.97(g) and (h), Applicants make no representation that the information is considered to be material to patentability. Additionally, inclusion on this list is not an admission that any of the cited documents are prior art in this application. Further, Applicants make no representation regarding the completeness of this list, nor represent that better art does not exist.

If this Supplemental IDS can be considered, Appellants authorize the Office to charge the relevant fee, if any, to Deposit Account 11-1410. If the IDS cannot be considered, Appellants request that it be placed in the file in accordance with Rule 1.97(i).

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 4-16-2012

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

13092164:ad
041012

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
(Multiple sheets used when necessary)	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,475,685	10-1984	Grimado, et al.	
	2	2004/0176880	09-09-2004	Obradovich, et al.	
	3	2006/0214014	09-28-2006	Bash, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	4	Bourhan, et al., "Cynamic model of an HVAC system for control analysis", Elsevier 2004	
	5	Written Opinion and Search Report for PCT/US2011/032537, dated 12/12/11 (our reference EFACT.012WO)	

13092139:ad
041012

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

KING JOHN R.

KNOBBE, MARTENS, OLSON & BEAR, LLP 2040 MAIN
STREET, 14TH FLOOR IRVINE CA 92614 USA**PCT****NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION**

(PCT Rule 44.1)

Date of mailing
(day/month/year) 12 DECEMBER 2011 (12.12.2011)

Applicant's or agent's file reference

EFACT012WO

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/US2011/032537International filing date
(day/month/year)**14 APRIL 2011 (14.04.2011)**

Applicant

ECOFACOR, INC. et al

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70**For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004, 9.011.**

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to any protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.**4. Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the PCT Applicant's Guide, National Chapters.

Name and mailing address of the ISA/KR



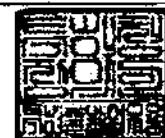
Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-8755



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IRVINE INT.

DEC 19 2011

KNOBBE, MARTENS,
OLSON & BEAR, LLP

* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for three months from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT Services => PCT Services

ID : PCT international application number

PW : 4ZMSLLZF

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: ipkc@ipkcenter.com

Phone: +1 703 388 1066

Fax: +1 703 388 1084

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference EFACT012WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2011/032537	International filing date (day/month/year) 14 APRIL 2011 (14.04.2011)	(Earliest) Priority Date (day/month/year) 26 MAY 2010 (26.05.2010)
Applicant ECOFACOR, INC. et al		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (See Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 7
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
b. ☐ none of the figure is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/032537**A. CLASSIFICATION OF SUBJECT MATTER***F24F 11/02(2006.01)i, H04Q 9/04(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F 11/02; G06F 17/00; G05D 23/00; F25B 9/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

cKOMPASS(KIPO internal) & Keywords: mobile, geographic, location, temperature

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0214014 A1 (CULLEN BASH et al.) 28 September 2006 See Abstract	1-22
A	US 2004-0176880 A1 (MICHAEL L. OBRADOVICH et al.) 09 September 2004 See Column 124-126	1-22

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents.

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

12 DECEMBER 2011 (12.12.2011)

Date of mailing of the international search report

12 DECEMBER 2011 (12.12.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JANG, GI JEONG

Telephone No. 82-42-481-5498



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/032537

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006-0214014 A1	28.09.2006	US 7640760 B2	05.01.2010
US 2004-0176880 A1	09.09.2004	AT 356734 T	15.04.2007
		AT 399110 T	15.07.2008
		AU 6245398 A	26.08.1998
		AU 6245398 A	26.08.1998
		CA 2283843 A1	13.08.1998
		CA 2283843 C	20.11.2007
		CA 2596489 A1	13.08.1998
		DE 69837318 D1	16.10.2008
		EP 0956219 A2	17.11.1999
		EP 0956219 A2	30.10.2002
		EP 0956219 A4	24.01.2001
		EP 0956219 B1	25.06.2008
		JP 2002-505631 A	19.02.2002
		JP 2002-505631 T	19.02.2002
		JP 2002-505631 T	19.02.2002
		US 06009355A A	28.12.1999
		US 06131060A A	10.10.2000
		US 2001-0020202 A1	06.09.2001
		US 2001-0021887 A1	13.09.2001
		US 2001-0029410 A1	11.10.2001
		US 2001-0038414 A1	08.11.2001
		US 2002-0065585 A1	30.05.2002
		US 2002-0082751 A1	27.06.2002
		US 2002-0082752 A1	27.06.2002
		US 2002-0156555 A1	24.10.2002
		US 2002-0198635 A1	26.12.2002
		US 2003-0004616 A1	02.01.2003
		US 2004-0162645 A1	19.08.2004
		US 2004-0162646 A1	19.08.2004
		US 2005-0165513 A1	28.07.2005
		US 2005-0203674 A1	15.09.2005
		US 2006-0200285 A1	07.09.2006
		US 2010-0175014 A1	08.07.2010
		US 6175782 B1	16.01.2001
		US 6233506 B1	15.05.2001
		US 6282464 B1	28.08.2001
		US 6330497 B1	11.12.2001
		US 6438465 B2	20.08.2002
		US 6449535 B1	10.09.2002
		US 6459961 B1	01.10.2002
		US 6542794 B2	01.04.2003
		US 6542795 B2	01.04.2003
		US 6577928 B2	10.06.2003
		US 6587758 B2	01.07.2003
		US 6587759 B2	01.07.2003
		US 6859687 B2	22.02.2005
		US 6922616 B2	26.07.2005

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/032537

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 7062362 B2	13.06.2006
		US 7124004 B2	17.10.2006
		US 7171291 B2	30.01.2007
		US 7499778 B2	03.03.2009
		WO 98-34812 A2	13.08.1998
		WO 98-34812A2	13.08.1998
		WO 98-34812A3	05.11.1998
		WO 98-34812A3	05.11.1998

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

KING JOHN R.

KNOBBE, MARTENS, OLSON & BEAR, LLP 3040 MAIN
STREET, 14TH FLOOR IRVINE CA 92614 USA

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis1f)

Date of mailing
(day/month/year) 12 DECEMBER 2011 (12.12.2011)

Applicant's or agent's file reference
EPACT912WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2011/032537

International filing date (day/month/year)

14 APRIL 2011 (14.04.2011)

Priority date(day/month/year)

26 MAY 2010 (26.05.2010)

International Patent Classification (IPC) or both national classification and IPC.

F14F 11/02(2006.01); H04Q 9/04(2006.01)

Applicant

ECOFACOR, INC. et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statements under Rule 43bis 1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later. For further options, see Form PCT/ISA/226.

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
Government Complex-Daejeon, 189
Cheongam-ro, Seo-gu, Daejeon 305-701, Republic of Korea
Facsimile No. 82-42-472-7140

Date of completion of this opinion

12 DECEMBER 2011 (12.12.2011)

Authorized officer

LANG, GI JEONG

Telephone No. 82-42-481-5498



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2011/032537**Box No. 1 Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of :
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:
 - a. a sequence listing filed or furnished
 - ☐ on paper
 - ☐ in electronic form
 - b. time of filing or furnishing
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2011/032537

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-22	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-22	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2006-0214014 A1 (CULLEN BASH et al.) 28 September 2006

D2: US 2004-0176880 A1 (MICHAEL L. OBRADOVICH et al.) 09 September 2004

1. Novelty and Inventive step**1.1 Claims 1 and 12**

The subject matter of claims 1 and 12 differs from the prior art documents of D1-D2 in that the prior art documents do not disclose a adjusting temperature setpoint comprising a mobile location and climate control devices. And it is not obvious to a person skilled in the art by the documents, taken alone or in combination.

Therefore, the subject matter of claims 1 and 12 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

1.2 Claims 2-11 and 13-22

Claims 2-11 and 13-22 are dependent on 1 and 12.

Therefore, the subject matter of claims 2-11 and 13-22 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step automatically.

2. Industrial Applicability

The subject matter of claims 1-22 is industrially applicable under PCT Article 33(4).

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	870	870
Extension-of-Time:				
0018				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				870

Electronic Acknowledgement Receipt

EFS ID:	12553240
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Daniela Lopez
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011A
Receipt Date:	16-APR-2012
Filing Date:	13-JUL-2009
Time Stamp:	18:42:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$870
RAM confirmation Number	5868
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.020 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	EFACT-011A_issuefee.pdf	105040 a30f006589b21677a27a705480ba46d1154a8	no	1
Warnings:					
Information:					
2		EFACT-011A_ids.pdf	90900 8a9f1a1f86c68098a0c6a81a1a494c1234015	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
3	Non Patent Literature	EFACT-011A_REF4.pdf	677648 8b5907a190056c34acc79374dec4b724b69581c49	no	17
Warnings:					
Information:					
4	Non Patent Literature	EFACT-011A_REF5.pdf	342266 ad180c35a18a8ee5d7171c495fd1525d51cd2c49	no	10
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30696 4610608a6115a84b10c49b7b1b2701b75717a	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1246550		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
(Multiple sheets used when necessary)	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	7,356,384	04-2008	Gull, et al.	
	2	7,784,704	08-31-2010	Harter	
	3	7,848,900	12-07-2010	Steinberg, John Douglas et al.	
	4	7,894,943	02-22-2011	Sloup et al.	
	5	2009/0240381	09-2009	Lane	
	6	2009/0281667	11-2009	Masui, et al.	
	7	2010/0019052	01-2010	Yip	
	8	2010/0070086	03-2010	Harrod, et al.	
	9	2010/0070089	03-2010	Harrod, et al.	
	10	2010/0070093	03-2010	Harrod, et al.	
	11	2010/0211224	08-2010	Keeling, et al.	
	12	2010/0235004	09-2010	Thind	
	13	2010/0289643	11-2010	Trundie, et al.	
	14	2011/0031323	02-2011	Nold, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

11686335:ad
08022011

Examiner Signature	/Dave Robertson/ (08/10/2011)	Date Considered	08/10/2011
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH /DCR/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

20995 7500 03/20/2012
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

ROBERTSON, DAVID

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 03/20/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

12/502,064

07/13/2009

John Douglas Steinberg

EFACT.011A

5514

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPLX. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$0	\$0	\$870	06/20/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the **ISSUE FEE** and **PUBLICATION FEE** (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

20995 7500 03/20/2012
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/502.064 07/13/2009 John Douglas Steinberg EFAC7.011A 5514

TITLE OF INVENTION: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

APPLX. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$870 \$0 \$0 \$870 06/20/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
ROBERTSON, DAVID	2121	700-276000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address for Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Date

Typed or printed name

Registration No.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



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UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
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 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	EEACT.011A	5514
<div> <div>20095750003/20/2012</div> <div> KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614 </div> </div>				
<div> <div>EXAMINER</div> <div>ROBERTSON, DAVID</div> </div>				
<div> <div>ART UNIT</div> <div>PAPER NUMBER</div> </div>				
<div> <div>2121</div> </div>				

DATE MAILED: 03/20/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(e)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 12/512,064 Examiner Dave Robertson	Applicant(s) STEINBERG, JOHN DOUGLAS Art Unit 2121
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-66) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1808.

1. ☒ This communication is responsive to 3/1/2012
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____ the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-10 and 12-21.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ new or 2) ☐ in Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.64(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)


1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08) Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413) Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other: _____
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/Dave Robertson/
 Primary Examiner, Art Unit 2121

EAST Search History**EAST Search History (Interference)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L182	196	700/276.cor.	USPAT; UPAD	ADJ	ON	2012/03/10 23:47
L183	410	236/46R.cor.	USPAT; UPAD	ADJ	ON	2012/03/10 23:47

3/ 10/ 2012 11:48:06 PM**C:\Users\drobertson2\Documents\EAST\Workspaces\12502064 Steinberg energy use
monitor tv viewing habits.wsp**

Search Notes 	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

SEARCHED

Class	Subclass	Date	Examiner
700	276	9/28/2010	dcr
62	176.6	2/26/2011	dcr
236	46R	2/26/2011	dcr
700	276, 278, 295, 296	2/26/2011	dcr
	(updated)	8/22/2011	dcr
	(updated)	3/10/2012	dcr

SEARCH NOTES

Search Notes	Date	Examiner
EAST (USPAT, PgPUB, Derwent - see complete search history in application file)	9/29/2010	dcr
"236"/\$ "700"/\$ "340"/\$ (text-limited and cross-classification search - see search history)	9/28/2010	dcr
EAST (updated)	2/26/2011	dcr
EAST (text limited, targeted limitation search - see EAST search note)	8/22/2011	dcr
STIC (EIC 2100) search (see search strategy note in application file)	8/19/2011	dcr
EAST (updated, targeted limitation search, see search note)	8/29/2011	dcr
EAST (updated)	3/10/2012	dcr

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
700	276	3/10/2012	dcr

/DAVE ROBERTSON/
Primary Examiner, Art Unit 2121

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L49	1	"12502064".nan. or ("12".src. and "502064".ap.)	US- POPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L50	1	"61134714".nan. or ("61".src. and "134714".ap.)	US- POPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L51	70	((JOHN) near2 (STEENSEFG)) INV.	US- POPUB; USPAT	ADJ	ON	2012/03/10 23:39
L52	58	("20090090699" "20090125151" "4403644" "4674027" "5672438" "5717609" "6145751" "6178362" "6351690" "6400996" "6437692" "6489803" "6536875" "6542078" "6549130" "6574537" "6594825" "6595430" "6596956" "6618555" "6622097" "6622925" "6622928" "6628937" "6633823" "6640567" "6671586"). FN.	US- POPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L53	527	700/276.cnt.	US- POPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L54	38	("236"/\$ "700"/\$ "340"/\$).cde.	US- POPUB; USPAT; DERWENT	AND	ON	2012/03/10 23:39
L55	227122	("236"/\$ "700"/\$ "340"/\$).cde.	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L56	16	(unoccup\$3 or occup\$3 or occupancy) and L54	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L57	157789	(unoccup\$3 or occup\$3 or occupancy or presence1 with (whn1 or person or user1 or identi\$2)	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L58	7	L57 and L56	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L59	8	L57 and L54	US- POPUB;	OR	ON	2012/03/10 23:39

			USPAT; DERWENT			
L60	6	L57 and L52	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L61	14	L58 or L59 or L60	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L52	10277	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity) with (identity or recognize))	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L63	919	L62 and L55	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L64	1	L62 and L54	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L65	1	L62 and L52	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L66	33	("6145751").LFPN	USPAT	ADJ	ON	2012/03/10 23:39
L67	0	("H002176").LFPN	USPAT	ADJ	ON	2012/03/10 23:39
L68	27	("20090009699" "20090125151" "4403644" "4674027" "5572438" "5717608" "6145751" "6178362" "6351093" "6400996" "6437692" "6480903" "6536675" "6548076" "6549130" "6574537" "6594825" "6595430" "6598058" "6619555" "6622097" "6622925" "6622528" "6628997" "6833823" "6643567" "6671586").FN	US- POPUB; USPAT; USOCR	ADJ	ON	2012/03/10 23:39
L69	1141	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity) with (identity or recognize))) .lab.cim	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L70	137	L55 and L68	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L71	5508	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity or individual) with (identif\$5 or recogni\$7))) .lab.cim	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L72	396	L71 and L55	US- POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L73	2816	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity or individual) near3	US- POPUB; USPAT;	OR	ON	2012/03/10 23:39

0034

0135

		20090284344-\$ or US-20090140838-\$ or US-20080251472-\$ or US- 20070146126-\$ or US-20070040672-\$ or US-20070006149-\$ or US- 20060267780-\$ or US-20040155781-\$ or US-20100156608-\$ or US- 20100136007-\$ or US-20090055403-\$ or US-20060283638-\$ or US- 20040175559-\$ or US-20040221003-\$ or US-20100162285-\$ or US- 20090293079-\$ or US-20090147772-\$ or US-20090052659-\$ or US- 20060045105-\$). did. or (US-6912429-\$ or US-6851621-\$ or US-5682949-\$ or US-6145751-\$ or US-H002176-\$ or US- 6549130-\$ or US-6542076-\$ or US- 6351693-\$ or US-6549816-\$ or US- 6671586-\$ or US-6643567-\$ or US- 6633823-\$ or US-6628997-\$ or US- 6622826-\$ or US-6622925-\$ or US- 6622097-\$ or US-6613655-\$ or US- 6598058-\$ or US-6595439-\$ or US- 6594825-\$ or US-6574537-\$ or US- 6536675-\$ or US-6480803-\$ or US- 6437692-\$ or US-6400996-\$ or US- 6178362-\$). did. or (US-5717606-\$ or US-5572436-\$ or US-4874027-\$ or US- 4403644-\$ or US-7354005-\$ or US- 7392042-\$ or US-7248170-\$ or US- 7027617-\$ or US-6633223-\$ or US- 7061390-\$ or US-5977964-\$ or US- 7260823-\$ or US-7242968-\$ or US- 7483954-\$ or US-6840145-\$ or US- 6418424-\$ or US-7706928-\$ or US- 7702421-\$ or US-7644669-\$ or US- 6260795-\$ or US-5818347-\$ or US- 5556927-\$ or US-5644036-\$ or US- 5462225-\$ or US-5314004-\$ or US- 5270952-\$ or US-5244146-\$). did. or (US-4655279-\$ or US-4341345-\$ or US-4138732-\$). did. or (WO- 2009089998-\$). did.	DERMENT			
L95	14	(US-20080281472-\$ or US- 20100156608-\$ or US-20100162285-\$ or US-20090052659-\$ or US- 20060045105-\$ or US-20070146126-\$). did. or (US-5977964-\$ or US- 5682949-\$ or US-H002176-\$ or US- 7061390-\$ or US-7260823-\$ or US- 7242968-\$ or US-7483954-\$ or US- 6912429-\$). did.	US- PGPUB; USPAT	ADJ	ON	2012/03/10 23:39
L96	0	L95 and (non\$tooccup\$)	US- PGPUB; USPAT; DERMENT	ADJ	ON	2012/03/10 23:39
L97	2	L94 and (non\$tooccup\$)	US- PGPUB; USPAT; DERMENT	ADJ	ON	2012/03/10 23:39
L100	53	(US-20090125151-\$ or US- 20090086639-\$ or US-20100162285-\$ or US-20100156608-\$ or US- 20090052659-\$ or US-20080281472-\$	US- PGPUB; USPAT	ADJ	ON	2012/03/10 23:39

0037

0038

L116	1	"12502064".rlan. or ("12".src. and "502064".ap.)	US-PGPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L117	2	"12177822".rlan. or ("12".src. and "177822".ap.)	US-PGPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L118	8	("20080283621" "5261481" "5476221" "6196468").PN.	US-PGPUB; USPAT; USOCR; DERWENT	ADJ	ON	2012/03/10 23:39
L119	2	("5261481").URPN.	USPAT	ADJ	ON	2012/03/10 23:39
L120	143	62/176.6.cor.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L121	10	(unoccup\$3 or non\$1occup\$4) same (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7) and L113	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L122	744	(unoccup\$3 or non\$1occup\$4) with (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L123	5382	(unoccup\$3 or non\$1occup\$4 or occupied) with (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L124	90	(US-20090125151-\$ or US-20090099699-\$ or US-20100123560-\$ or US-20100019051-\$ or US-20090284344-\$ or US-20090140838-\$ or US-20080281472-\$ or US-20070146126-\$ or US-20070040672-\$ or US-20070008149-\$ or US-20060267780-\$ or US-20040155781-\$ or US-20100156608-\$ or US-20100138007-\$ or US-20090055403-\$ or US-20060283938-\$ or US-20040178889-\$ or US-20040231003-\$ or US-20100162285-\$ or US-20090293079-\$ or US-20090147772-\$ or US-20090052859-\$ or US-20060045105-\$).did. or (US-6912429-\$ or US-6851621-\$ or US-5682949-\$ or US-6145751-\$ or US-H002176-\$ or US-6549130-\$ or US-6542076-\$ or US-6351693-\$ or US-6549816-\$ or US-6671586-\$ or US-6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622926-\$ or US-6622925-\$ or US-6622097-\$ or US-6619555-\$ or US-6598056-\$ or US-6595430-\$ or US-6594825-\$ or US-6574537-\$ or US-	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39

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		6418424-\$ or US-7706928-\$ or US-7702421-\$ or US-7644869-\$ or US-6260765-\$ or US-5818347-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US-5314004-\$ or US-5270952-\$ or US-5244146-\$).did. or (US-4655279-\$ or US-4341345-\$ or US-4136732-\$ or US-7509402-\$ or US-7587464-\$ or US-7590703-\$ or US-7657636-\$ or US-7455236-\$ or US-7421727-\$ or US-7156316-\$ or US-5261481-\$ or US-7793510-\$).did. or (WO-2009069998-\$ or US-6196468-\$).did.				
L135	230702	(unoccup\$3 or non\$1occup\$4 or occupied or presence) same (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L136	32	L134 and L135	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L137	143	62/176.6.cor.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L138	527	700/276.cor.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L139	452	236/46R.cor.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L140	1266	700/276,278,295,296.cor.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L141	3	(US-20090052859-\$ or US-20080281472-\$).did. or (US-5977964-\$).did.	US-PGPUB; USPAT	ADJ	ON	2012/03/10 23:39
L142	230702	(unoccup\$3 or non\$1occup\$4 or occupied or presence) same (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L143	1	L142 and L141	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L144	2	"7055759".pn.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2012/03/10 23:39
L145	230702	(unoccup\$3 or non\$1occup\$4 or occupied or presence) same (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39

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		or US-20100162285-\$ or US-20080293379-\$ or US-20090147772-\$ or US-20090052859-\$ or US-20080045105-\$ or US-20080233621-\$) did. or (US-6912429-\$ or US-6851621-\$ or US-5682949-\$ or US-6145751-\$ or US-14092176-\$ or US-6549130-\$ or US-6842076-\$ or US-6351693-\$ or US-6549816-\$ or US-6671566-\$ or US-6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622926-\$ or US-6622925-\$ or US-6622037-\$ or US-6613555-\$ or US-6598058-\$ or US-6595430-\$ or US-6594825-\$ or US-6576537-\$ or US-6536675-\$ or US-6480803-\$ or US-6437692-\$ or US-6400986-\$ or US-6178362-\$) did. or (US-5717609-\$ or US-5572435-\$ or US-4874027-\$ or US-4453644-\$ or US-7354005-\$ or US-7392042-\$ or US-7248179-\$ or US-7027617-\$ or US-6633223-\$ or US-7081393-\$ or US-5977964-\$ or US-7260823-\$ or US-7242988-\$ or US-7483954-\$ or US-6640145-\$ or US-6418424-\$ or US-7706928-\$ or US-7702421-\$ or US-7644869-\$ or US-6260795-\$ or US-5518347-\$ or US-5585927-\$ or US-5544056-\$ or US-5462225-\$ or US-5314004-\$ or US-5270952-\$ or US-5244146-\$) did. or (US-4856279-\$ or US-4341345-\$ or US-4136732-\$ or US-7509462-\$ or US-7587464-\$ or US-7590703-\$ or US-7657636-\$ or US-7455236-\$ or US-7421727-\$ or US-7156318-\$ or US-5261491-\$ or US-7793510-\$ or US-7055759-\$) did. or (WO-2009059998-\$ or US-6196466-\$) did.				
L162	2	L161 and rosen in.	US-POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
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L164	0	"11926050"	US-POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L165	22	("20050043256" "20060071067" "20080186214" "20070045491" "5995042" "5396048" "5476221" "5538181" "6643068" "6845518" "699" 029"). PN.	US-POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L166	6	L165 and override	US-POPUB; USPAT; DERWENT	OR	ON	2012/03/10 23:39
L167	1	(11:335182).APP.	USPAT; USOCR	OR	ON	2012/03/10 23:39

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3/10/2012 11:47:14 PM

C:\Users\drobertson2\Documents\EAST\Workspaces\12502064 Steinberg energy use
monitor tv viewing habits.wsp

DAVE ROBERTSON

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NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
DAVE ROBERTSON Primary Examiner Art Unit 2101	03/10/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

EFACT.011A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Douglas Steinberg
App. No.	: 12/502,064
Filed	: July 13, 2009
For	: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: David Robertson
Art Unit	: 2121
Conf No.	: 5514

RESPONSE TO OFFICE ACTION DATED OCTOBER 4, 2011

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed October 4, 2011, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Summary of Interview begins on page 7 of this paper.

Remarks/Arguments begin on page 9 of this paper.

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Filing Date: July 13, 2009

AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 9, 10, 12, 20, and 21 as indicated below. Also, please cancel Claims 11 and 22 without prejudice or disclaimer.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated with a-said structure deemed to be occupied;

determining whether one or more networked electronic devices inside said structure are in use, wherein said networked electronic devices comprise a graphic user interface comprising a display, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users;

in response to use of said one or more networked devices, determining whether that said HVAC system is set to said first HVAC temperature setpoint indicating that said structure is deemed to be non occupied;

determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing said first HVAC temperature setpoint to said second HVAC temperature setpoint indicating that said structure is deemed to be occupied;

prompting said one or more users based on said determining that ~~providing electronic notice to said~~ one or more of said users user's input should be obtained, wherein said prompting sends a message to at least one of said networked electronic devices that said first HVAC system is set for a non-occupied structure and whether to change said first HVAC temperature setpoint to a-said second HVAC temperature setpoint associated with occupancy of said structure; and

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in response to said prompting, receiving input from said one or more users to keep said first HVAC temperature setpoint; and

keeping said first HVAC temperature setpoint based upon said input from said one or more users ~~user response to said electronic notice.~~

2. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a television.

3. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a personal computer.

4. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is connected to the Internet.

5. (Previously Presented) The method of Claim 1 in which programming being watched or listened to using at least one of said networked electronic devices is used to determine which occupant of said structure is likely to be present, and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one networked electronic device.

6. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a game console.

7. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices communicates with a remote server.

8. (Canceled)

9. (Currently Amended) The method of Claim 1 further comprising in which said adjusting of said temperature setpoint is initiated by ~~with~~ a remote computer.

10. (Currently Amended) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically based on said input from said one or more users.

11. (Canceled)

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12. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the existence of occupants in said structure;

one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint;

wherein said electronic devices and said thermostat are connected to a network;

an application comprising one or more computer processors in communication with said network, wherein said application determines whether said one or more electronic devices are in use and in response, whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied,

said application determining that said one or more users has previously indicated a preference that said user's input be obtained before automatically changing said first HVAC temperature setpoint to said second HVAC temperature setpoint indicating that said structure is deemed to be occupied;

said application prompting said one or more users based on said determining that said one or more of said user's input should be obtained,

wherein said application provides electronic notice to one or more of said users of said electronic devices that said thermostat is set for a non-occupied

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Filing Date: July 13, 2009

structure and whether to keep said first temperature setpoint or change to said second temperature setpoint ; and

wherein said application in response to said prompting, receives input from said one or more users to keep said first HVAC temperature setpoint; and

wherein said ~~said~~ thermostat is kept at said first temperature setpoint based upon said input from said one or more users~~user response to said electronic notice.~~

13. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a television.

14. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a personal computer.

15. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is connected to the Internet.

16. (Previously Presented) The system of Claim 12 in which the programming being watched or listened to using said electronic devices is used to determine which occupant of said structure is likely to be using at least one of said electronic devices, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one electronic device.

17. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a game console.

18. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices communicates with a remote server.

19. (Canceled)

20. (Currently Amended) The system of Claim 12 further comprising a remote computer that varies ~~in which variation of said first temperature setpoint is initiated by a remote computer.~~

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21. (Currently Amended) The system of Claim 12 in which said first temperature setpoint is varied automatically based on said input from said one or more users.

22. (Canceled)

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SUMMARY OF INTERVIEW

Attendees, Date and Type of Interview

The interview was conducted on February 7, 2012 and attended by Examiner Robertson, John Steinberg and John R. King.

Exhibits and/or Demonstrations

None.

Identification of Claims Discussed

Claim 1.

Identification of Prior Art Discussed

U.S. Publication No. 2008/0281472 to Podgorny, et al.

"Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings" to Wang, et al.

Johnson Controls - T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3, T600HCP-3 Part No. 24-9890-560, 2006.

Emerson Climate Technologies - Network Thermostat of E2 Building Controller Installation and Operation Manual.

U.S. Patent No. 5,977,964 to Williams, et al.

Proposed Amendments

See the amendments made to Claim 1 as set forth above.

Principal Arguments and Other Matters

In brief, none of the cited references, even when combined, have the following elements: monitoring usage of a networked electronic device to determine a structure deemed non-occupied is now occupied, providing electronic notice of a potential change to occupancy, and allowing a user to decline a proposed change so that the non-occupancy setting remains.

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For example, the cited Johnson Controls and Emerson references describe the ability for a user to change a non-occupancy setting to an occupancy setting, such as when a user is returning from vacation.

These references, however, fail to teach the concept of automatically notifying the user that a non-occupied setting will be changed to an occupied setting and then allowing the user to override the change by retaining the non-occupied setting.

In other words, the amended claims allow a user to override a proposed change to occupancy so that the non-occupied setting remains.

Results of Interview

It was Applicant's understanding that it would be helpful to clarify how the claimed elements interact with each other. It was also Applicant's understanding that the proposed amendments would be further reviewed upon submission of this response.

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REMARKS

The October 4, 2011 Office Action was based upon pending Claims 1-7, 9-18 and 20-22. This Amendment amends Claims 1, 9, 10, 12, 20, and 21 as well as cancels Claims 11 and 22.

Thus, after entry of this Amendment, Claims 1-7, 9, 10, 12-18, 20 and 21 are pending and presented for further consideration.

INTERVIEW

Applicant would like to thank Examiner Robertson for the interview extended to Applicant's counsel of record, John R. King and inventor John Steinberg. The interview helped applicant better understand the rejections raised in the Office Action.

ISSUES RAISED IN THE OFFICE ACTION

In the Office Action, Claims 1, 3, 4, 7, 9-12, 14, 15, 18 and 20-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2008/0281472 to Podgorny, et al. (hereinafter "Podgorny") in view of the article "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings" to Wang, et al. (hereinafter "Wang") and either of Johnson Controls - T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3, T600HCP-3 Part No. 24-9890-560, 2006 (hereinafter "Johnson Controls"), or the Emerson Climate Technologies - Network Thermostat of E2 Building Controller Installation and Operation Manual (hereinafter "Emerson").

Further, Claims 2, 5, 6, 13, 16 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Podgorny in view of Wang, Johnson Controls or Emerson Climate Technologies as applied to Claims 1 and 12, and further in view of U.S. Patent No. 5,977,964 to Williams, et al. (hereinafter "Williams").

In this response, Podgorny, Wang, Johnson Controls, Emerson Climate Technologies and Williams will be referred to both individually and collectively as "the cited references."

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In addition, paragraph numbers referenced herein are based on the paragraph numbering set forth in the published application – U.S. Publication No. 2010/0280667 A1 (hereafter “the Published Application”).

REJECTION OF CLAIMS 1, 3, 4, 7, 9-12, 14, 15, 18, AND 20-22 UNDER § 103(a)

In the Office Action, Claims 1, 3, 4, 7, 9-12, 14, 15, 18 and 20-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podgorny, in view of Wang, and either of Johnson Controls, or Emerson.

Claims 1 and 12

As discussed in the interview, none of the cited references, even when combined, have the following elements: 1) determining that a user has previously indicated a preference for input before changing temperature settings, 2) before automatically changing the temperature setting prompting a user for input, 3) receiving user input to keep the non-occupied setting, and 4) keeping the non-occupancy setting. Each of these differences is discussed below.

1) User Preferences

In amended Claims 1 and 12, the use of networked electronic devices is used to determine whether a structure that was previously deemed non-occupied should be treated as occupied.

In addition, in response to use of the networked electronic devices, a determination is made that the HVAC system is set to a non-occupied temperature setpoint.

Before automatically changing a temperature setpoint from non-occupied to occupied, amended Claims 1 and 12 include determining whether the user has indicated a preference for user input.

In contrast, none the cited references, either alone or in combination, teach this concept.

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2) Before Automatically Changing a Temperature Setting Prompting The User For Input

Amended Claims 1 and 12 are also directed to prompting a user for input regarding a potential change from a non-occupied to an occupied setting. For example, the user is prompted based on determining that the user's input should be obtained. This prompting sends a message to the user that the HVAC system is set for a non-occupied structure and prompts whether to change the HVAC temperature setpoint to a second HVAC temperature setpoint associated with occupancy of the structure.

Again, none of the cited references, even when combined, prompt a user before automatically changing from a non-occupied to occupied setting.

3) Receiving User Input To Keep The Non-Occupied Setting

After the user has been prompted, amended Claims 1 and 12 are directed to the situation where the user then chooses not to automatically change the temperature setting from non-occupied to occupied. In other words, the user chooses to keep the HVAC temperature setting for a non-occupied structure.

As discussed in the interview, none of the cited references, even when combined, describe the concept of overriding an automatic change from non-occupied to occupied so that the non-occupied setting remains.

4) Keeping The Non-Occupancy Setting

In amended Claims 1 and 12, based on the user input, the HVAC temperature setpoint is not changed and remains at the non-occupancy setting. Thus, even though the system determines occupancy and desires to automatically change the non-occupied setting, the non-occupancy setting remains.

During the interview, it was discussed that the cited Johnson Controls and Emerson references describe the ability for a user to change a non-occupancy setting to an occupancy setting, such as when a user is returning from vacation.

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These references, however, fail to teach the concept of automatically notifying the user that a non-occupied setting will be changed to an occupied setting and then allowing the user to override the change by retaining the non-occupied setting.

In other words, the amended claims allow a user to override a proposed change to occupancy so that the non-occupied setting remains.

Legal Standard for Obviousness Under § 103

The case, KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727, 82 U.S.P.Q.2d 1385 (2007), in no way relieves the Patent Office of its obligation to consider all claim limitations when determining patentability of an invention over the prior art.

Accordingly, it remains well settled law that a finding of “obviousness requires a suggestion of all limitations in a claim.” CFMT, Inc. v. Yieldup Intern. Corp., 349 F.3d 1333, 1342 (Fed. Cir. 2003) (emphasis added) (cited in Ex Parte Wada, 2008 WL 142652, *4 (Bd.Pat.App. & Interf., Jan. 14, 2008)).

In the aftermath of KSR, the Board of Patent Appeals and Interferences has repeatedly reversed findings of obviousness when the Examiner has failed to proffer a prima facie case of obviousness. See, e.g., Wada, 2008 WL 142652 at *5 (“Because the Examiner has not explained why every limitation in claim 1 would have been obvious to a person of ordinary skill in the art, we agree with Appellants that the Examiner has not made out a case of prima facie obviousness.”)

No Prima Facie Case of Obviousness

In view of the arguments set forth herein, Appellant submits that Claims 1 and 12 are patentable over the cited references based on at least the following elements:

- 1) determining that a user has previously indicated a preference for input before changing temperature settings,
- 2) before automatically changing a temperature setting, prompting a user for input,
- 3) receiving user input to keep the non-occupied setting, and

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4) keeping the non-occupancy setting.

Thus, in order to establish a prima facie case of obviousness for the pending claims, references must be presented that when combined, have each and every claim element. However, none of cited references even when combined suggests such elements. Accordingly, Applicant asserts that Claim 1 is not obvious in view of the cited references.

Applicant therefore respectfully submits that Claim 1 is patentably distinguished over the cited references and Applicant respectfully requests allowance of Claim 1.

Claims 3, 4, 7, and 9-11

Claims 3, 4, 7, and 9-11 depend from amended Claim 1 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 1, and because of the additional features recited therein.

Claim 11

In this response, Claim 11 has been canceled; thus the rejection associated with Claim 11 is now moot.

Claims 14, 15, 18, 20, and 21

Claims 14, 15, 18, 20, and 21 depend from amended Claim 12 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 12, and because of the additional features recited therein.

Claim 22

In this response, Claim 22 has been canceled; thus the rejection associated with Claim 22 is now moot.

REJECTION OF CLAIMS 2, 5, 6, 13, 16, AND 17 UNDER 35 U.S.C. §103(a)

Claims 2, 5, 6, 13, 16, and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Podgorny in view of Wang, Johnson Controls or Emerson Climate Technologies as applied to Claims 1 and 12, and further in view of U.S. Patent No. 5,977,964 to Williams, et al. (hereinafter "Williams").

Application No.: 12/502,064

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Claims 2, 5 and 6

Applicant notes that Claims 2, 5, and 6 depend from amended Claim 1 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 1, and because of the additional features recited therein.

Claims 13, 16, and 17

Applicant notes that Claims 13, 16, and 17 depend from amended Claim 12 and are believed to be patentable for the same reasons articulated above with respect to amended Claim 12, and because of the additional features recited therein.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/944,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/211,690 Now Pat. 8,019,567	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat

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Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Now Pat. 8,010,237	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg	12/502,064 Published 2010/0280667	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Published 2010/0318227	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Published 2010/0282857	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Published 2010/0308119	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Pending	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Now Pat. 8,090,477	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Published 2011/0077896	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Published 2011/0166828	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Cheung et al.	13/219,381 Published 2011/0307103	08/26/11	EFACT.010C1	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	13/230,610 Pending	09/12/11	EFACT.006C1	System And Method For Evaluating Changes In The Efficiency Of An HVAC System

Application No.: 12/502,064**Filing Date: July 13, 2009**

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg	13/329,117 Pending	12/16/11	EFACT.013C1	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Application No.: 12/502,064
Filing Date: July 13, 2009

CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 3/1/2012

By: John R. King

John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

12859216
030112

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	0068 2252	1	280	280

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				280

Electronic Acknowledgement Receipt

EFS ID:	12205743
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Erica Van Sciver
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011A
Receipt Date:	01-MAR-2012
Filing Date:	13-JUL-2009
Time Stamp:	18:18:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 280
RAM confirmation Number	6459
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0070 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011A_response.pdf	712609 615d196e99f229026a1ff16a106e9f206681d1b70c	yes	17
Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Amendment/Req. Reconsideration-After Non-Final Reject			1	1	
Claims			2	6	
Applicant summary of interview with examiner			7	8	
Applicant Arguments/Remarks Made in an Amendment			9	17	

Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	30951 81882a61d7024b106190db797caba2115681d16c	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	743560
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTD-580 (07-06)

Approved for use through 10/1/2007 OMB 3500-0002
 U.S. Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE
 Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTD-575					Application or Ombuds Number 12/502,084		Filing Date 07/13/2009		<input type="checkbox"/> To be Mailed	
APPLICATION AS FILED - PART I										
(Column 1)			(Column 2)		SMALL ENTITY <input checked="" type="checkbox"/> OR		OTHER THAN SMALL ENTITY			
PCR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR		RATE (\$)	FEE (\$)		
<input type="checkbox"/> BASIC FEE (37 CFR 1.101(a), (b) or (c))	N/A	N/A	N/A	N/A						
<input type="checkbox"/> SEARCH FEE (37 CFR 1.102(a), (b) or (c))	N/A	N/A	N/A	N/A						
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.102(a), (b) or (c))	N/A	N/A	N/A	N/A						
TOTAL CLAIMS (37 CFR 1.102)	N/A	N/A	X \$ =	X \$ =						
INDEPENDENT CLAIMS (37 CFR 1.102)	N/A	N/A	X \$ =	X \$ =						
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.103) If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 411(a)(1)(G) and 37 CFR 1.18(c).										
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.102)										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	03/01/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.102)	18	N/A	22	X \$ =	0			X \$ =	
	Independent (37 CFR 1.102)	2	N/A	3	X \$ =	0			X \$ =	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.103)									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.103)									
					TOTAL AMEND FEE	0			TOTAL AMEND FEE	
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR		RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.102)	N/A	N/A	X \$ =	N/A			X \$ =		
	Independent (37 CFR 1.102)	N/A	N/A	X \$ =	N/A			X \$ =		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.103)									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.103)									
					TOTAL AMEND FEE				TOTAL AMEND FEE	
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3. ** If the "Highest Number Previously Paid For" is 0, \$0 ACF is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 1, enter "1". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
STELLA LITTLE

This collection of information is required by 37 CFR 1.10. The information is required to obtain or retain a benefit by the public which is to be paid by the USPTO to protect an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, reviewing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on this version of this form required to complete this form and/or suggestions for reducing the burden should be sent to the United Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22315-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22315-1450.

If you need assistance in completing the form, call 1-800-FID-9100 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	BEFACT.011A	5514
20995 7590 02/17/2012 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER ROBERTSON, DAVID	
			ART UNIT	PAPER NUMBER
			2121	
			NOTIFICATION DATE	DELIVERY MODE
			02/17/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcarter@kmob.com
 cfiling@kmob.com
 cOAPilot@kmob.com

Applicant-Initiated Interview Summary

Application No.

12/602,064

Applicant(s)

STEINBERG, JOHN
DOUGLAS

Examiner

Dave Robertson

Art Unit

2121

All participants (applicant, applicant's representative, PTO personnel):

(1) Dave Robertson(3) John Steinberg (Applicant)(2) Alex John King (Reg. No. 34,862)

(4) _____

Date of interview: 07 February 2012

Type:

☐ Telephonic☐ Video Conference☒ Personal (copy given to: ☐ applicant☐ applicant's representative)Exhibit shown or demonstration conducted: ☐ Yes☒ No

If Yes, brief description: _____

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☐ Others

(For each of the checked boxes above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1

Identification of prior art discussed: _____

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references, etc.)

Discussed proposed and further clarifying amendments to claim 1 in view of distinctions and advantages of the present invention over the prior art and as described generally in the marketplace by Applicant. No agreement reached on allowability; however, Examiner indicated particular amendments capturing discussion and tried in response with Remarks thereto, subject to final search and consideration, may give rise to allowability, and recommended further exchange of potential claim amendments to be followed by submission of same in response with remarks arguing claimed distinction(s) over the prior art of record and/or as previously applied. Representative agreed to recodification of Interview Summary herein in lieu of copy provided at interview.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04) If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment/Dave Robertson
Primary Examiner, Art Unit 2121

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)**

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Applicant-Initiated Interview Summary

Application No.

12/002,064

Applicant(s)

STEINBERG, JOHN
DOUGLAS

Examiner

Dave Robertson

Art Unit

2121

All participants (applicant, applicant's representative, PTO personnel):

(1) Dave Robertson(3) Inventor John Steinberg(2) Art John King

(4) _____

Date of interview: 26 August 2011.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal (copy given to: ☐ applicant ☐ applicant's representative)

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.

If Yes, brief description: _____.

Issues Discussed ☐ 101 ☒ 112 ☐ 102 ☒ 103 ☐ Others

(For each of the checked boxes) above, please briefly before the issue and detailed description of the discussion.)

Claim(s) discussed: 1 and 12.

Identification of prior art discussed: Johnson Controls T600HCx 3 Single Stage Thermostats Installation Instructions T600HCN-8; Emerson Climate Technologies, Network Thermostat for E2 Building Controller Installation and Operation Manual; Wang, D.; Arens, E.; Federspiel, C., Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings (see 892 attached herewith for complete citation).

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a pertinent thereof, claim interpretation, proposed amendments, agreement of any applied references, etc...)

Discussed amendment of 8/2/2011 wrt 112(2) rejection previously made. Examiner agreed present amendments overcome rejections under 112(2) and that claims are supported by the disclosure. Examiner called attention to page 7 of the prior office action (3/3/2011) as stating that allowance over Podgorny et al. may be negated by amendments that render the claims definite, because prior indication of allowability was explained as based on the best interpretation possible from the plain meaning of the words in the claim in light of the specification. Examiner indicated that with the present amendments, while satisfying 112 could be rejected over Podgorny et al. in view of additional prior art. Discussion of the potential rejection of Podgorny et al. in view of either Emerson or Johnson Controls (as above and cited in the office action herewith), and further in view of Wang and Federspiel et al. did not result in any agreement. Examiner recommended issuing an office action with the new grounds of rejection over amended claims to afford Applicant opportunity to fully consider the prior art and response. Examiner indicated further interview may be warranted and welcomed after Applicant receipt and review of forthcoming office action.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

(Case) Robertson
 Primary Examiner, Art Unit 2121

Summary of Record of Interview Requirements**Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record**

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)**

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	BEFACT011A	5514
20995 7590 10/04/2011 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER ROBERTSON, DAVID	
			ART UNIT	PAPER NUMBER
			2121	
			NOTIFICATION DATE	DELIVERY MODE
			10/04/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcarter@kmob.com
 cfiling@kmob.com
 cOAPilot@kmob.com

Office Action Summary

Application No.

12/502,064

Applicant(s)

STEINBERG, JOHN DOUGLAS

Examiner

Dave Robertson

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If 30 periods for reply as specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (36 U.S.C. § 133).
- Any reply filed by the Office later than 1 year after the mailing date of this communication, even if timely filed, may result in any pending patent term adjustment. (See 37 CFR 1.204(c).)

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7, 9, 18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7, 9, 18 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-945)
- 3) ☒ Information Disclosure Statement(s) (PTO-658a)
Paper No(s)/Mail Date 2/2/21
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date 2/2/21
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

1. This is a Non-final office action in response to Applicant's reply of 8/2/2011.

Claims 1-7, 9-18, and 20-22 are pending.

Response to Amendment

2. Applicant amends claims 1 and 12 to clarify the invention and in response to rejections previously made under 35 U.S.C. 112, 2nd paragraph. Accordingly, the rejections are withdrawn.

3. Applicant's amendments substantively distinguish the present invention from the scope of claims previously presented for which an interpretation was taken for examination on the merits and an indication of allowability *based on the interpretation* and conditioned on overcoming the rejection under 112, 2nd paragraph, was made. While the present amendments overcome the 112, 2nd paragraph, rejection, the scope of claim is not the scope of claims previously presented. Accordingly, the indication of allowability of claims 1-7, 9-18, and 20-22 as set forth in the previous office action (of 3/3/201, see page 6) is withdrawn.

Response to Arguments

2. Applicant's arguments with respect to claims 1 and 12 have been considered but are moot in view of the new ground(s) of rejection.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 1, 3, 4, 7, 9-12, 14, 15, 18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Podgorny et al. (US 20080281472 A1) in view of Wang et al. ("Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings," 2003) and either of Johnson Controls (T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3, T600HCP-3 Part No. 24-9890-560, 2006) or Emerson Climate Technologies (Network Thermostat for E2 Building Controller Installation and Operation Manual, 2007).

Claim 1

Podgorny et al. teaches **a method for varying temperature setpoints for an HVAC system** (Abstract) **comprising:**

storing at least a first HVAC temperature setpoint associated with a structure that is deemed to be non-occupied and at least a second HVAC temperature setpoint associated a said structure deemed to be occupied (see ¶[0009, 0019, 0028, 0092] see also Table 2, occupancy and high/low min/max temperature setting fields);

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determining whether one or more networked electronic devices inside said structure are in use (see ¶[0083]),

wherein said networked electronic devices comprise a graphic[al] user interface, comprising a display (see ¶[0027,0067,0080]),

wherein said networked electronic devices receive input from one or more users (see ¶[0027]), wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users (see ¶[0083]);

However, Podgorny does not *expressly* teach as specifically recited:

determining whether said HVAC system is set to said first HVAC temperature setpoint indicating that said structure is deemed to be non-occupied;

providing electronic notice to one or more of said users of said networked electronic devices that said HVAC system is set for a non-occupied structure and offering to change said first HVAC temperature setpoint to a second HVAC temperature setpoint associated with occupancy of said structure; and

keeping said first HVAC temperature setpoint upon user response to said electronic notice.

Wang et al. (2003) expressly teaches advantage to occupant's involvement in control loops (see pg. 3, section 4.3) by allowing occupants to receive messages to help improve environmental control and reduce energy usage, including where "ideally occupants should have access to the system's control strategy, and also be able to

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override it at any time.” (pg. 4, left column). Both Johnson Controls (pgs. 10 and 12) and Emerson Climate Technologies (pg. 9) teach thermostat user interfaces which prompt users to override the unoccupied temperature settings, expressly such that in Emerson, the prompt is provided only if status is nonoccupied as in Johnson Controls where the “override prompt only appears when the thermostat is in the unoccupied state.” That, Podgorny teaches a Notification Agent (see ¶[0109,0127]) as well as a Presence Agent (¶[0083]) including full integration with occupancy sensors and notifications to a user interface, and that Wang et al. teaches advantage at providing such override capability in the form of user prompts, and further that Johnson Controls and Emerson teach prompts to the user provided only when the HVAC system is set for non-occupied status, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide such prompts, thereby involving the user advantageously in control of their environment, and whereby the effect of the user not responding to such prompt allows the system to maintain the unoccupied temperature setpoint thus reducing energy usage.

Claim 3

Podgorny et al. teaches **the method of Claim 1 in which at least one of said networked electronic devices is a personal computer** (Fig. 2B).

Claim 4

Podgorny et al. teaches **the method of Claim 1 in which at least one of said networked electronic devices is connected to the Internet** (see ¶[0024]).

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Claims 7 and 9

Podgorny et al. teaches **he method of Claim 1 in which at least one of said networked electronic devices communicates with a remote server; and in which said adjusting of said temperature setpoint is initiated by a remote computer** (see Abstract, the user controlling “over the Internet” at a remote computer).

Claim 10

Podgorny et al. teaches **the method of Claim 1 in which said first HVAC temperature setpoint is varied automatically** (see Abstract, “autonomous process control” is *automatic*).

Claim 11

Podgorny et al. teaches **the method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said first HVAC temperature setpoint** (see rationale above for claim 1 in combination with Wang et al., the override prompt serving to *confirm occupancy*, broadly, by requiring a response to override the current unoccupied temperature setting).

Claim 12

Podgorny et al. teaches **a system for altering the setpoint on a thermostat for space conditioning of a structure** (see Abstract), **comprising:**
at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure (see ¶[0195]), **and**

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at least a second temperature setpoint associated with the existence of occupants in said structure (see ¶[0009, 0019, 0028, 0092] see also Table 2, occupancy and high/low min/max temperature setting fields);

one or more electronic devices having at least a graphic[al] user interface comprising a display (see ¶[0027,0067,0080]);

wherein said electronic devices receive input from one or more users (see ¶[0027]) **wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users** (see ¶[0083])

wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint (see ¶[0083, 0122]);

wherein said electronic devices and said thermostat are connected to a network (see Figure 22);

an application comprising one or more computer processors in communication with said network (see Figure 20, 22),

However, Podgorny does not *expressly* teach as specifically recited:

wherein said application determines whether said one or more electronic devices are in use and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied,

wherein said application provides electronic notice to one or more of said users of said electronic devices that said thermostat is set for a non-occupied

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structure, and whether to keep said first temperature setpoint or change to said second temperature setpoint of a determination of non-occupancy; and

wherein said thermostat is kept at adjusted from said first temperature setpoint setting associated with the presence of one or more occupants in said structure to said temperature setting associated with the absence of occupants in said structure based upon user response to said electronic notice.

Wang et al. (2003) expressly teaches advantage to occupant's involvement in control loops (see pg. 3, section 4.3) by allowing occupants to receive messages to help improve environmental control and reduce energy usage, including where "ideally occupants should have access to the system's control strategy, and also be able to override it at any time." (pg. 4, left column). Both Johnson Controls (pgs. 10 and 12) and Emerson Climate Technologies (pg. 9) teach thermostat user interfaces which prompt users to override the unoccupied temperature settings, expressly such that in Emerson, the prompt is provided only if status is nonoccupied as in Johnson Controls where the "override prompt only appears when the thermostat is in the unoccupied state." That, Podgorny teaches a Notification Agent (see ¶[0109,0127]) as well as a Presence Agent (¶[0083]) including full integration with occupancy sensors and notifications to a user interface, and that Wang et al. teaches advantage at providing such override capability in the form of user prompts, and further that Johnson Controls and Emerson teach prompts to the user provided only when the HVAC system is set for non-occupied status, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide such prompts, thereby involving the user

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advantageously in control of their environment, and whereby the effect of the user not responding to such prompt allows the system to maintain the unoccupied temperature setpoint thus reducing energy usage.

Claims 14, 15, 18, and 20-22 recite further system features of claim 12 similarly as above for the methods of claims 3, 4, 7, 9, 10 and 11, and is/are similarly rejected for reasons given above, for the respective claim and claim elements.

6. Claim 2, 5, 6, 13, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Podgorny et al. in view of Wang et al. Johnson Controls or Emerson Climate Technologies as applied to claims 1 and 12 above, and further in view of Williams et al. (US Pat. No. 5,977,964)

Podgorny et al. does not expressly teach **at least one of said networked electronic devices is a television; in which programming being watched or listened to using at least one of said networked electronic devices is used to determine which occupant of said structure is likely to be present, and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one networked electronic device; or in which at least one of said networked electronic devices is a game console.**

Williams et al. expressly teaches selecting the second temperature setpoint (occupied setting) in response to identifying the user based on the programming being watched on a television (see Figure 1; Abstract; column 5, lines 20-40) or a game

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console (see column 5, lines 25-30: computer used to access Internet Games is a "games console"). As Podgorny expressly also identifies the specific user (see ¶[0082]) by Presence Monitoring by various means including keyboard activity and biometrics to select environmental settings including temperature settings, it would have been obvious to one of ordinary skill in the art at the time of the invention that the electronic device of Podgorny may be an electronics device such as a television or game console, thereby expanding the range of devices known in the art for monitoring to indicate occupancy and more precisely identify particular users.

Conclusion

7. The prior art made of record and listed on the attached PTO Form 892 but not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on Weekdays 8:15 am to 4:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dave Robertson/
Examiner, Art Unit 2121

Notice of References Cited	Application/Control No. 12/502,064		Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS	
	Examiner Dave Robertson		Art Unit 2121	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,261,481 A	11-1993	Baldwin et al.	165/237
*	B	US-5,761,083 A	06-1998	Brown et al.	700/296
*	C	US-7,354,005 B2	04-2008	Carey et al.	236/46R
*	D	US-2008/0283621 A1	11-2008	QUIRINO et al.	236/1.C
*	E	US-7,565,225 B2	07-2009	Dushane et al.	700/276
*	F	US-2010/0019051 A1	01-2010	Rosen, Howard	236/46.R
*	G	US-7,802,618 B2	09-2010	Simon et al.	165/254
*	H	US-2007/0045431	03-2007	Chapman et al.	236/046.00C
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)			
	U	Wang, D.; Arens, E.; Federspiel, C.. Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor Networks in Buildings. Energy Systems Laboratory (http://esl.tamu.edu), 2003 [Retrieved 9/1/2011] Downloaded from http://repository.tamu.edu/handle/1969.1/5210 .			
	V	Johnson Controls T600HCx-3 Single-Stage Thermostats Installation Instructions T600HCN-3, T600HCP-3 Part No. 24-9890-560, Rev. — Issued September 20, 2006			
	W	Emerson Climate Technologies. Network Thermostat for E2 Building Controller Installation and Operation Manual. 026-1721 Rev 0 10/30/2007.			
	X				

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

SEARCHED			
Class	Subclass	Date	Examiner
700	276	9/28/2010	dcr
62	176.6	2/26/2011	dcr
236	46R	2/26/2011	dcr
700	276, 278, 295, 296	2/26/2011	dcr
	(updated)	8/22/2011	dcr

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (USPAT, PgPUB, Derwent - see complete search history in application file)	9/29/2010	dcr
"236"/\$ "700"/\$ "340"/\$ (text-limited and cross-classification search - see search history)	9/28/2010	dcr
EAST (updated)	2/26/2011	dcr
EAST (text limited, targeted limitation search - see EAST search note)	8/22/2011	dcr
STIC (EIC 2100) search (see search strategy note in application file)	8/19/2011	dcr
EAST (updated, targeted limitation search, see search note)	8/29/2011	dcr

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

	/DAVE ROBERTSON/ Primary Examiner, Art Unit 2121
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File 347: JAPI O Dec 1976- 2011/ APR(Updat ed 110807)

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File 350: Derwent WPI X 1963- 2011/ UD=201152

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Set	Items	Description
S1	7799704	OCCUPAN? OR OCCUPY? OR OCCUPIE? ? OR INHABIT? OR PRESENT? - OR PRESENCE? OR ACTI V? OR MOTI ON? OR MOVEMENT? OR MOVING? OR - MOVE? ? OR KEYSTROKE? OR KEY() STROKE? OR (BUTTON? OR MOUSE?) (- 2N) (PRESS? OR CLI CK? OR DCUBLECLI CK?) OR UNOCCUPAN? OR UNOCCU- PY? OR UNOCCUPIE? ? OR NONOCCUP? OR UNINHABIT?
S2	3401381	(NETWORK? OR DEVI CE? ? OR APPLI ANCE? ? OR APPARATUS?? OR E- LECTRONI CS OR COMPUTER? OR PHONE? ? OR CELLPHONE? OR SMARTPHO- NE? OR PDA OR PDAS OR PERSONAL() DI GI TAL() ASSI STANT? OR BLACKB- ERR??? OR CONSOLE? ? OR (GAME? ? OR GAM NG) (1N) MACHI NE? ? OR - TV OR TELEVI SI ON?) (2N) (USE OR USES OR USED OR USI NG? OR USAGE? OR UTI LI Z? OR UTI LI S? OR TRAFFI C? OR OPERAT? OR ON OR VI EW - OR VI EWED OR VI EW NG?)
S3	936131	S1: S2(5N) (DETERM I N? OR DETECT? OR F I ND??? OR FOUND OR LOCA- T? OR I DENTI F? OR DI SCOVER? OR SENS??? OR LEARN??? OR RECOGNI ? OR NOTI C? OR ASCERTAI N? OR DI SOERN?)
S4	3049946	USER? ? OR PERSON? ? OR PEOPLE? OR I NDI VI DUAL? OR EMPLOYE?? OR WORKER? ? OR COOWKER? ? OR STUDENT? ? OR I NHABI TANT? OR - RESI DENT? OR OCCUPANT? OR DWELLER? ? OR TENANT? ? OR GUEST? ? OR ENTI TY? OR ENTI TI E? ? OR VI EWER? ? OR PLAYER? ? OR WHO
S5	166164	S4(5N) (PROMPT? OR ASK??? OR I NQUI R? OR ENQUI R? OR QUERY??? OR QUERI E? ? OR QUESTI ON? OR SUMMON? OR SOLI CI T? OR NOTI C? OR NOTI F? OR MESSAGE? OR MESSAGI NG? OR POPUP? OR POP() (UP OR UPS) OR OCNFI RM? OR VALI DAT? OR VERI F?)
S6	3651692	HVAC OR CL I MATE() OONTROL? OR HEATI NG(1W) (COOLI NG? OR AI R() - OONDI TI ONI NG? OR VENTI LATI ON?) OR THERMOSTAT? OR TEMPERATURE? OR WARM? ? ? ? ? OR COOL? ? ? ? ? OR HUM I D?
S7	359787	S6(3N) (SETPOI NT? OR SET() POI NT? OR SETTI NG? ? OR PROGRAM? ? OR PROGRAMMI NG? OR LEVEL? ? OR CONTROL?)
S8	44279	S7(7N) (CHANG? OR MODI F? OR ALTER? OR AMEND? OR ADJUST? OR - ADAPT? OR SW TCH? OR OVERRI D? OR OVER() RI D??? OR SUPERSED? OR I GNOR? OR DI SREGARD? OR ACCEPT? OR REPLAC?)
S9	23	S5(20N) S8
S10	1	S3 AND S9
S11	22	S9 NOT S10
S12	14	(S11 AND PY=1963:2008) OR (S11 AND AY=1963:2008 AND AC=US)
S13	14	IDPAT S12 (sorted i n dupli cate/ non-dupli cate order)
S14	34	S3 AND S5 AND S8
S15	33	S14 NOT (S10 OR S11)
S16	26	(S15 AND PY=1963:2008) OR (S15 AND AY=1963:2008 AND AC=US)
S17	26	IDPAT S16 (sorted i n dupli cate/ non-dupli cate order)

File 348: EUROPEAN PATENTS 1978-201132

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File 349: PCT FULLTEXT 1979-2011/UB=20110811|UT=20110804

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Set	Items	Description
S1	3142620	OCCUPAN? OR OCCUPY? OR OCCUPIE? ? OR INHABIT? OR PRESENT? - OR PRESENCE? OR ACTIVE? OR MOTION? OR MOVEMENT? OR MOVING? OR - MOVE? ? OR KEYSTROKE? OR KEY() STROKE? OR (BUTTON? OR MOUSE?)(- 2N)(PRESS? OR CLICK? OR DOUBLECLICK?) OR UNOCCUPAN? OR UNOCCUPY? OR UNOCCUPIE? ? OR NONOCCUP? OR UNINHABIT?
S2	1199424	(NETWORK? OR DEVICE? ? OR APPLIANCE? ? OR APPARATUS?? OR ELECTRONICS OR COMPUTER? OR PHONE? ? OR CELLPHONE? OR SMARTPHONE? OR PDA OR PDAS OR PERSONAL() DIGITAL() ASSISTANT? OR BLACKBERRY??? OR CONSOLE? ? OR (GAME? ? OR GAMING)(1N) MACHINE? ? OR - TV OR TELEVISION?)(2N)(USE OR USES OR USED OR USING? OR USAGE? OR UTILIZ? OR UTILIS? OR TRAFFIC? OR OPERAT? OR ON OR VIEW - OR VIEWED OR VIEWING?)
S3	1037010	S1: S2(5N)(DETERMINE? OR DETECT? OR FIND??? OR FOUND OR LOCATE? OR IDENTIFY? OR DISCOVER? OR SENSE??? OR LEARN??? OR RECOGNIZE? OR NOTICE? OR ASCERTAIN? OR DISCOVER?)
S4	2036522	USER? ? OR PERSON? ? OR PEOPLE? OR INDIVIDUAL? OR EMPLOYEE? OR WORKER? ? OR COWORKER? ? OR STUDENT? ? OR INHABITANT? OR - RESIDENT? OR OCCUPANT? OR DWELLER? ? OR TENANT? ? OR GUEST? ? OR ENTITY? OR ENTITLED? ? OR VIEWER? ? OR PLAYER? ? OR WHO
S5	175563	S4(5N)(PROMPT? OR ASK??? OR INQUIRE? OR ENQUIRE? OR QUERY??? OR QUERY? ? OR QUESTION? OR SUMMON? OR SOLICIT? OR NOTICE? OR NOTIFY? OR MESSAGE? OR MESSAGING? OR POPUP? OR POP()(UP OR UPS) OR CONFIRM? OR VALIDATE? OR VERIFY?)
S6	1507469	HVAC OR CLIMATE() CONTROL? OR HEATING(1W)(COOLING? OR AIR() - CONDITIONING? OR VENTILATION?) OR THERMOSTAT? OR TEMPERATURE? OR WARM???? OR COOL???? OR HUMID?
S7	228040	S6(3N)(SETPOINT? OR SET() POINT? OR SETTING? ? OR PROGRAM? ? OR PROGRAMMING? OR LEVEL? ? OR CONTROL?)
S8	31555	S7(7N)(CHANGE? OR MODIFY? OR ALTER? OR AMEND? OR ADJUST? OR - ADAPT? OR SWITCH? OR OVERRID? OR OVER() RID??? OR SUPERSEDE? OR IGNORE? OR DISREGARD? OR ACCEPT? OR REPLACE?)
S9	38	S5(20N) S8
S10	5	S3(100N) S9
S11	33	S9 NOT S10
S12	26	(S11 AND PY=1978:2008) OR (S11 AND AY=1978:2008 AND AC=US)
S13	26	IDPAT S12 (sorted in duplicate/non-duplicate order)
S14	41	S3(100N) S5(100N) S8
S15	35	S14 NOT (S10 OR S11)
S16	25	(S15 AND PY=1978:2008) OR (S15 AND AY=1978:2008 AND AC=US)
S17	25	IDPAT S16 (sorted in duplicate/non-duplicate order)

File 8: E-Compendex(R) 1984-2011/Aug V8
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File 438: Library Lit. & Info. Science 1984-2011/Jul
(c) 2011 The HW Wilson Co

File 103: Energy Sci Tec 1974-2011/Jul 82
(c) 2011 Contains copyrighted material

Set	Items	Description
S1	29253183	OCCUPANT? OR OCCUPY? OR OCCUPIE? ? OR INHABIT? OR PRESENT? - OR PRESENCE? OR ACTIVE? OR MOTION? OR MOVEMENT? OR MOVING? OR - NONE? ? OR KEYSTROKE? OR KEY(s) STROKE? OR (BUTTON? OR MOUSE?) (- 2N) (PRESS? OR CLICK? OR DOUBLECLICK?) OR UNOCCUPANT? OR UNOCCU- PY? OR UNOCCUPIE? ? OR NONOCCUP? OR UNINHABIT?
S2	2912919	(NETWORK? OR DEVICE? ? OR APPLIANCE? ? OR APPARATUS?? OR E- ELECTRONICS OR COMPUTER? OR PHONE? ? OR CELLPHONE? OR SMARTPHO- NE? OR PDA OR PDAS OR PERSONAL(?) DIGITAL(?) ASSISTANT? OR BLACKB- ERRY??? OR CONSOLE? ? OR (GAME? ? OR GAMING? (MACHINE? ? OR - TV OR TELEVISION?) (2N) (USE OR USES OR USED OR USING? OR USAGE? OR UTILIZ? OR UTILISE? OR TRAFFIC? OR OPERAT? OR ON OR VIEW - OR VIEWED OR VIEWING?)
S3	2452459	S1: S2(5N) (DETERMINE? OR DETECT? OR FIND??? OR FOUND OR LOCA- TY? OR IDENTIFY? OR DISCOVER? OR SENS??? OR USARP??? OR RECOGN? ? OR NOTICE? OR ASCERTAIN? OR DISCERN?)
S4	9387850	USER? ? OR PERSON? ? OR PEOPLE? OR INDIVIDUAL? OR EMPLOYEE?? OR WORKER? ? OR CONWORKER? ? OR STUDENT? ? OR INHABITANT? OR - RESIDENT? OR OCCUPANT? OR DWELLER? ? OR TENANT? ? OR GUEST? ? OR ENTITY? OR ENTITYE? ? OR VIEWER? ? OR PLAYER? ? OR WHO
S5	273875	S4(5N) (PROMPT? OR ASK??? OR INQUIR? OR ENQUIR? OR QUERY??? OR QUERIE? ? OR QUESTION? OR SUMMON? OR SOLICIT? OR NOTICE? OR NOTIFY? OR MESSAGE? OR MESSAGING? OR POPUP? OR POP(UP OR UPS) OR CONFIRM? OR VALIDAT? OR VERIFY?)
S6	10992933	HVAC OR CLIMATE(?) CONTROL? OR HEATING/COOLING? OR AIR(?) - CONDITIONING? OR VENTILATION? OR THERMOSTAT? OR TEMPERATURE? OR WARM??? OR COOL??? OR HUMID?
S7	415111	S6(3N) (SETPOINT? OR SET(?) POINT? OR SETTING? ? OR PROGRAM? ? OR PROGRAMMING? OR LEVEL? ? OR CONTROL?)
S8	26275	S7(7N) (CHANGE? OR MODIFY? OR ALTER? OR AMEND? OR ADJUST? OR - ADAPT? OR SWITCH? OR OVERRIDE? OR OVER(?) RID??? OR SUPERSEDE? OR IGNORE? OR OVSREGARD? OR ACCEPT? OR REPLACT?)
S9	10	S6(20N) S8

S10	4	S3 AND S5 AND S8
S11	10	S9: S10 NOT PY>2008
S12	9	RD S11 (unique items)
S13	238	S3(20N) S8
S14	50	S13 AND S4
S15	48	S14 NOT S9: S10
S16	42	S15 NOT PY>2008
S17	34	RD S16 (unique items)
S18	2865	S3(15N) S5
S19	76	S18 AND S6
S20	75	S19 NOT (S9: S10 OR S14)
S21	62	S20 NOT PY>2008
S22	50	RD S21 (unique items)
S23	2396	AU=(STEI NBERG J? OR STEI NBERG J?)
S24	0	S23 AND S3 AND S7

File 275: Gale Group Computer DEX™ 1983-2011/Jun 28
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File 521: Gale Group New Prod. Annou. (R) 1985-2011/Jun 17
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File 636: Gale Group Newsletter DEX™ 1987-2011/Aug 16
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File 15: Gale Group PROMI (R) 1990-2011/Aug 16
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File 100: Gale Group PROMI (R) 1972-1989
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(c) 2010 REED BUSINESS INFORMATION LTD.
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(c) 1999 PR Newswire Association Inc
File 810: Business Wire 1999-2011/Aug 18
(c) 2011 Business Wire
File 813: PR Newswire 1999-2011/Aug 18
(c) 2011 PR Newswire Association Inc

Set	Item	Description
S1	24070949	OCCUPANT? OR OCCUPY? OR OCCUPIED? ? OR INHABIT? OR PRESENT? ? OR PRESENCE? OR ACTIVE? OR MOTION? OR MOVEMENT? OR MOVING? OR MOVE? ? OR KEYSTROKE? OR KEY() STROKE? OR (BUTTON? OR MOUSE?) (-2N) (PRESS? OR CLICK? OR DOUBLECLICK?) OR UNOCCUPANT? OR UNOCCUPY? OR UNOCCUPIED? ? OR NONOCCUP? OR UNINHABIT?
S2	5420590	(NETWORK? OR DEVICE? ? OR APPLIANCE? ? OR APPARATUS?? OR ELECTRONICS OR COMPUTER? OR PHONE? ? OR CELLPHONE? OR SMARTPHONE? OR PDA OR PDAS OR PERSONAL() DIGITAL() ASSISTANT? OR BLACKBERRY??? OR CONSOLE? ? OR (GAME? ? OR GAMING (1N) MACHINE? ? OR TV OR TELEVISION?) (2N) (USE OR USES OR USED OR USING? OR USAGE? OR UTILIZ? OR UTILIS? OR TRAFFIC? OR OPERAT? OR ON OR VIEW-OR VIEWED OR VIEWING?)
S3	1432271	S1; S2 (5N) (DETERMINE? OR DETECT? OR FIND??? OR FOUND OR LOCATE? OR IDENTIFY? OR DISCOVER? OR SENSE??? OR LEARN??? OR RECOGN? OR NOTICE? OR ASCERTAIN? OR DISCERN?)
S4	34044422	USER? ? OR PERSON? ? OR PEOPLE? OR INDIVIDUAL? OR EMPLOYEE? OR WORKER? ? OR COWORKER? ? OR STUDENT? ? OR INHABITANT? OR RESIDENT? OR OCCUPANT? OR DWELLER? ? OR TENANT? ? OR GUEST? ? OR ENTITY? OR ENTITLED? ? OR VIEWER? ? OR PLAYER? ? OR WHO
S5	1885240	S4 (5N) (PROMPT? OR ASK??? OR INQUIRE? OR ENQUIRE? OR QUERY??? OR QUERYED? ? OR QUESTION? OR SUMMON? OR SOLICIT? OR NOTICE? OR NOTICE? OR MESSAGE? OR MESSAGING? OR POPUP? OR POP() (UP OR UPS) OR CONFIRM? OR VALIDATE? OR VERIFY?)
S6	2635934	HVAC OR CLIMATE() CONTROL? OR HEATING/1W (COOLING? OR AIR()) CONDITIONING? OR VENTILATION? OR THERMOSTAT? OR TEMPERATURE? OR WARM????? OR COOL????? OR HUMID?
S7	208886	S6 (3N) (SETPOINT? OR SET() POINT? OR SETTING? ? OR PROGRAM? ? OR PROGRAMMING? OR LEVEL? ? OR CONTROL?)
S8	15181	S7 (7N) (CHANGE? OR MODIFY? OR ALTER? OR AMEND? OR ADJUST? OR ADAPT? OR SWITCH? OR OVERRIDE? OR OVER() RID??? OR SUPERSEDE? OR

IGNOR? OR DISREGARD? OR ACCEPT? OR REPLAC?)

S9	29	S5(20N) S8
S10	10	S3(100N) S5(100N) S8
S11	33	S9: S10 NOT PY>2008
S12	25	RD S11 (uni que i tems)
S13	260	S3(20N) S8
S14	110	S13(50N) S4
S15	106	S14 NOT S9: S10
S16	91	S15 NOT PY>2008
S17	59	RD S16 (uni que i tems)
S18	9147	S3(15N) S5
S19	29	S18(100N) S7
S20	25	S19 NOT (S9: S10 OR S14)
S21	24	S20 NOT PY>2008
S22	16	RD S21 (uni que i tems)

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
5154	92	(US-20090125151-\$ or US-20090099669-\$ or US-20100123580-\$ or US-20100019051-\$ or US-20090204344-\$ or US-20090140838-\$ or US-20090251472-\$ or US-20070146128-\$ or US-20070040872-\$ or US-20070008149-\$ or US-20060267780-\$ or US-20040155781-\$ or US-20100156698-\$ or US-20100135007-\$ or US-20090055403-\$ or US-20090283938-\$ or US-20040178859-\$ or US-20040231003-\$ or US-20100162285-\$ or US-20090220079-\$ or US-20090147772-\$ or US-20090052859-\$ or US-20060045105-\$ or US-20080283821-\$).dtd. or (US-6912429-\$ or US-6551621-\$ or US-5862949-\$ or US-6146751-\$ or US-H002176-\$ or US-6549100-\$ or US-6542076-\$ or US-6351693-\$ or US-6549516-\$ or US-6671566-\$ or US-6043587-\$ or US-6639623-\$ or US-6588597-\$ or US-6622926-\$ or US-6622925-\$ or US-6622097-\$ or US-6619555-\$ or US-6598056-\$ or US-6595430-\$ or US-6594825-\$ or US-6574537-\$ or US-6536875-\$ or US-6480803-\$ or US-6437692-\$ or US-6400996-\$ or US-6178362-\$).dtd. or (US-5717809-\$ or US-5572438-\$ or US-4674097-\$ or US-4403644-\$ or US-7354005-\$ or US-7392042-\$ or US-7248170-\$ or US-7027617-\$ or US-6633223-\$ or US-7061393-\$ or US-5977964-\$ or US-7266823-\$ or US-7242888-\$ or US-7483964-\$ or US-6040146-\$ or US-0418424-\$ or US-7700928-\$ or US-7702421-\$ or US-7644889-\$ or US-6260765-\$ or US-5818347-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US-6314004-\$ or US-6270952-\$ or US-5244146-\$).dtd. or (US-4655275-\$ or US-4341345-\$ or US-4136732-\$ or US-7509402-\$ or US-7587464-\$ or US-7590703-\$ or US-7657636-\$ or US-7455236-\$ or US-7421727-\$ or US-7158316-\$ or US-5261481-\$ or US-7793510-\$ or US-7055759-\$).dtd. or (WO-2009069998-\$ or US-6196406-\$).dtd	US-POPJIB; USPAT; DEFWENT	OR	ON	2011/08/22 14:12
5155	2	5154 and rosen.in.	US-POPJIB; USPAT; DEFWENT	OR	ON	2011/08/22 14:12

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		5544036-\$ or US-5402225-\$ or US-5314004-\$ or US-5270952-\$ or US-5244146-\$) did. or (US-4655279-\$ or US-4341345-\$ or US-4136732-\$ or US-7509402-\$ or US-7507464-\$ or US-7500703-\$ or US-7557636-\$ or US-7456236-\$ or US-7421727-\$ or US-7156316-\$ or US-5281481-\$ or US-7703510-\$ or US-7055755-\$ or US-6645918-\$ or US-5395042-\$ or US-7602618-\$) did. or (WO-2009066998-\$ or US-6198468-\$ or US-20070046431-\$ or US-20060196214-\$ or US-6843008-\$ or US-20040246351-\$ or WO-9520782-\$) did.				
S193	2564	11" and over\$1ride	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 15:56
S194	33	S192 and (over\$1ride)	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 15:56
S195	16	S192 and (over\$1ride same \$2occup\$5)	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 15:56
S196	10	S192 and (over\$1ride same \$2occup\$5) same (user or operator)	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 16:00
S197	6	S192 and (over\$1ride same \$2occup\$5) same (user or operator) same (input or prompt\$4 or ask\$3)	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 16:01
S198	121	("5544036").USPN.	USPAT	OR	ON	2011/08/22 16:14
S199	2	S198 and (over\$1ride same \$2occup\$5) same (user or operator)	US-POPUB; USPAT; DERWENT	OR	ON	2011/08/22 16:14

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
(Multiple sheets used when necessary)	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	7,356,384	04-2008	Gull, et al.	
	2	7,784,704	08-31-2010	Harter	
	3	7,848,900	12-07-2010	Steinberg, John Douglas et al.	
	4	7,894,943	02-22-2011	Sloup et al.	
	5	2009/0240381	09-2009	Lane	
	6	2009/0281667	11-2009	Masui, et al.	
	7	2010/0019052	01-2010	Yip	
	8	2010/0070086	03-2010	Harrod, et al.	
	9	2010/0070089	03-2010	Harrod, et al.	
	10	2010/0070093	03-2010	Harrod, et al.	
	11	2010/0211224	08-2010	Keeling, et al.	
	12	2010/0235004	09-2010	Thind	
	13	2010/0289643	11-2010	Trundle, et al.	
	14	2011/0031323	02-2011	Nold, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

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Examiner Signature	/Dave Robertson/ (08/10/2011)	Date Considered	08/10/2011
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 1 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,403,644	09-13-1983	Hebert, Raymond T.	
	2	4,674,027	06-16-1987	Thomas J. Beckey	
	3	5,572,438	11-05-1996	Ehlers, et al.	
	4	5,717,609	02-10-1998	Packa, et al.	
	5	6,145,751	11-14-2000	Ahmed	
	6	6,178,362	01-23-2001	Woolard, et al.	
	7	6,351,693	02-26-2002	Monie	
	8	6,400,996	06-04-2002	Hoffberg, et al.	
	9	6,437,692	08-20-2002	Petite, et al.	
	10	6,478,233	11-12-2002	Shah	
	11	6,480,803	11-12-2002	Pierret, et al.	
	12	6,483,906	11-19-2002	Lggulden, et al.	
	13	6,536,675	03-25-2003	Pesko, et al.	
	14	6,542,076	04-01-2003	Joao	
	15	6,549,130	04-15-2003	Joao	
	16	6,574,537	06-02-2003	Kipersztok, et al.	
	17	6,580,950	06-17-2003	Johnson	
	18	6,594,825	07-15-2003	Goldschmidtiki, et al.	
	19	6,595,430	07-22-2003	Shah	
	20	6,598,056	07-22-2003	Hull, et al.	
	21	6,619,555	09-16-2003	Howard B. Rosen	
	22	6,622,097	09-16-2003	Robert R. Hunter	
	23	6,622,115	09-16-2003	Brown, et al.	
	24	6,622,925	09-23-2003	Carner, et al.	
	25	6,622,926	09-23-2003	Sartain, et al.	
	26	6,628,997	09-30-2003	Fox, et al.	
	27	6,633,823	10-14-2003	Bartone, et al.	
	28	6,643,567	11-04-2003	Kolk et al.	
	29	6,671,586	12-30-2003	Davis, et al.	

Examiner Signature	Date Considered
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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 2 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,695,218	02-24-2004	Fleckenstein	
	31	6,726,113	04-27-2004	Guo	
	32	6,731,992	05-04-2004	Ziegler	
	33	6,734,806	05-11-2004	Cratsley	
	34	6,772,052	08-03-2004	Amundsen	
	35	6,785,592	08-31-2004	Smith	
	36	6,785,630	08-31-2004	Kolk	
	37	6,789,739	09-14-2004	Howard Rosen	
	38	6,853,959	02-08-2005	Ikeda, et al.	
	39	6,868,293	03-15-2005	Schurr	
	40	6,868,319	03-15-2005	Kipersztok, et al.	
	41	6,882,712	04-19-2005	Iggulden, et al.	
	42	6,889,908	05-10-2005	Crippen, et al.	
	43	6,891,838	10-10-2005	Petite, et al.	
	44	6,991,029	01-31-2006	Orfield, et al.	
	45	7,009,493	03-07-2006	Howard	
	46	7,031,880	04-18-2006	Seem, et al.	
	47	7,039,532	05-02-2006	Hunter	
	48	7,089,088	08-08-2006	Terry, et al.	
	49	7,130,719	10-31-2006	Ehlers, et al.	
	50	7,130,832	10-31-2006	Bannai, et al.	
	51	7,167,079	01-23-2007	Smyth, et al.	
	52	7,187,986	03-06-2007	Johnson, et al.	
	53	7,205,892	04-17-2007	Luebke, et al.	
	54	7,215,746	05-08-2007	Iggulden, et al.	
	55	7,216,015	05-08-2007	Poth, Robert J.	
	56	7,231,424	06-11-2007	Bodin, et al.	
	57	7,232,075	06-19-2007	Rosen	
	58	2003/0040934 A1	02-27-2003	Skidmore, et al.	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 3 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	59	2005/0222889 A1	10-06-2005	Lai, et al.	
	60	2005/0288822 A1	12-29-2005	Rayburn, Ronald	
	61	2007/0043477 A1	02-22-2007	Elhers, et al.	
	62	2008/0083234 A1	04-10-2008	Krebs et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	63	ARNES, FEDERSPEIL, WANG, HUIZENG,., How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings, 2005, research paper., Center for the Built Environment. Controls and Information Technology	
	64	Comverge SuperStat Flyer	
	65	Control4 Wireless Thermostat Brochure	
	66	Cooper Power Systems Web Page	
	67	Enernoc Web Page	
	68	Enerwise Website	
	69	JOHNSON CONTORLS, Touch4 building automation system brochure, 2007	
	70	KILICOTTE, PIETTE, WATSON, , Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York, Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA., August 13-18, 2006	
	71	LIN, AUSLANDER and FEDERSPEIL, "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002	
	72	PIER, Southern California Edison., Deman Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report	
	73	Proliphix Thermostat Brochure	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language translation is attached. ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DCR/

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 4 OF 4	Attorney Docket No.	JSTEIN.011A

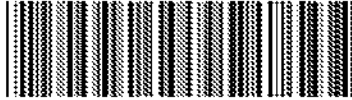
NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	74	WANG, ARENS, FEDERSPIEL., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor networks in Buildings," (2003), Center for Environmental Design Research	
	75	WETTER, WRIGHT, A comparison of deterministic and probabilistic optimization algorithms for nonsmooth simulation-based optimization., Building and Environment 39, 2004, Pages 989-999	

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Examiner Signature	/Dave Robertson/ (09/27/2011)	Date Considered	09/27/2011
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language translation is attached. ~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DCR/~~

Index of Claims 	Application/Control No. 12562064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant

☐ CPA

☐ T.O.

☐ R.1.47

CLAIM		DATE							
Final	Original	09/24/2010	02/26/2011	08/29/2011					
	1	✓	✓	✓					
	2	✓	✓	✓					
	3	✓	✓	✓					
	4	✓	✓	✓					
	5	✓	✓	✓					
	6	✓	✓	✓					
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	16	✓	✓	✓					
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	19	✓	✓	✓					
	20	✓	✓	✓					
	21	✓	✓	✓					
	22	✓	✓	✓					

EFACT.011A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Douglas Steinberg
App. No.	: 12/502,064
Filed	: July 13, 2009
For	: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: David Robertson
Art Unit	: 2121
Conf No.	: 5514

RESPONSE TO MARCH 3, 2011 OFFICE ACTION

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed March 3, 2011, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Application No.: 12/502,064

Filing Date: July 13, 2009

AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 5, 10-12, and 20-22 as indicated below.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least ~~an~~ a first HVAC temperature setting setpoint associated with a structure that is deemed to be non-occupied ~~and at least a second HVAC temperature setpoint associated a said structure deemed to be occupied;~~

determining whether one or more networked electronic devices inside said structure are in use, wherein said networked electronic devices comprise a graphic user interface comprising a display, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users;

~~determining whether lack of said use of said networked electronic devices indicates non-occupancy of~~ said HVAC system is set to said first HVAC temperature setpoint indicating that said structure is deemed to be non occupied;

providing electronic notice to one or more of said users of said networked electronic devices ~~of a determination of non-occupancy that said HVAC system is set for a non-occupied structure and offering to change said first HVAC temperature setpoint to a second HVAC temperature setpoint associated with occupancy of said structure; and~~

keeping said first HVAC temperature setpoint ~~adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure to the HVAC temperature associated with a structure that is deemed to be non-occupied based upon user response to said~~ electronic notice.

2. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a television.

Application No.: 12/502,064

Filing Date: July 13, 2009

3. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a personal computer.

4. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is connected to the Internet.

5. (Currently Amended) The method of Claim 1 in which programming being watched or listened to using at least one of said networked electronic devices is used to determine which occupant of said structure is likely to be present, and the second HVAC temperature setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one networked electronic device.

6. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices is a game console.

7. (Previously Presented) The method of Claim 1 in which at least one of said networked electronic devices communicates with a remote server.

8. (Canceled)

9. (Previously Presented) The method of Claim 1 in which said adjusting of said temperature setpoint is initiated by a remote computer.

10. (Currently Amended) The method of Claim 1 in which said first HVAC temperature setpoint is varied automatically.

11. (Currently Amended) The method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said first HVAC temperature setpoint.

12. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least ~~one~~ a first temperature setpoint ~~setting associated with the presence of one or more occupants in a non-~~

Application No.: 12/502,064

Filing Date: July 13, 2009

occupied structure, and at least one a second temperature setting setpoint associated with the existence absence of occupants in said structure;

one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users, ~~and wherein lack of said use of said electronic devices indicates non-occupancy of said structure~~ wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint;

wherein said electronic devices and said thermostat are connected to a network;

an application comprising one or more computer processors in communication with said network, wherein said application determines whether said one or more electronic devices are in use and whether said thermostat is set to said first temperature setpoint that indicates said structure is not occupied, wherein said application provides electronic notice to one or more of said users of said electronic devices that said thermostat is set for a non-occupied structure and whether to keep said first temperature setpoint or change to said second temperature setpoint of a determination of non-occupancy; and

wherein ~~said setpoint on said thermostat is kept at adjusted from said first temperature setpoint setting associated with the presence of one or more occupants in said structure to said temperature setting associated with the absence of occupants in said structure~~ based upon user response to said electronic notice.

13. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a television.

Application No.: 12/502,064

Filing Date: July 13, 2009

14. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a personal computer.

15. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is connected to the Internet.

16. (Previously Presented) The system of Claim 12 in which the programming being watched or listened to using said electronic devices is used to determine which occupant of said structure is likely to be using at least one of said electronic devices, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one electronic device.

17. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices is a game console.

18. (Previously Presented) The system of Claim 12 in which at least one of said electronic devices communicates with a remote server.

19. (Canceled)

20. (Currently Amended) The system of Claim 12 in which variation of said first temperature setpoints-setpoint is initiated by a remote computer.

21. (Currently Amended) The system of Claim 12 in which said first temperature setpoint is varied automatically.

22. (Currently Amended) The system of Claim 12 in which an occupant is prompted to confirm occupancy prior to adjustment of said first temperature setpoint.

Application No.: 12/502,064

Filing Date: July 13, 2009

REMARKS

The March 3, 2011 Office Action was based upon pending Claims 1-7, 9-18 and 20-22. This Amendment amends Claims 1, 5, 10-12, and 20-22. Thus, after entry of this Amendment, Claims 1-7, 9-18 and 20-22 are pending and presented for further consideration.

ISSUES RAISED IN THE OFFICE ACTION

In the Office Action, Claims 1-7, 9-18 and 20-22 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

In response, Applicant has amended the pending claims to more clearly focus on aspects of the embodiments shown in Figure 7 and described in paragraph 0039. Accordingly, Applicant submits that the pending claims have been amended to overcome the indefinite issues raised in the Office Action.

Claim 1

With respect to novelty and non-obviousness, the cited references do not appear to teach providing electronic notice to one or more users of the networked electronic devices that the HVAC system is set for a non-occupied structure. This notice also offers to change a first HVAC temperature setpoint to a second HVAC temperature setpoint associated with occupancy of said structure.

Futhermore, the cited references do not appear to teach the concept of keeping the first HVAC temperature setpoint based upon user response to the electronic notice.

Thus, Applicant respectfully requests allowance of Claim 1.

Claims 2-7 and 9-11

Claims 2-7 and 9-11 depend from Claim 1 and are believed to be patentable for the same reasons articulated above with respect to Claim 1, and because of the additional features recited therein.

Application No.: 12/502,064

Filing Date: July 13, 2009

Claim 12

Independent Claim 12 is of different scope than the other independent claims and Applicant requests the Examiner to separately evaluate the patentability of Claim 12 in light of the arguments set forth below.

In particular, Claim 12 is directed to a system for altering the setpoint on a thermostat for space conditioning of a structure. Claim 12 comprises at least one thermostat having at least a first temperature setpoint associated with a non-occupied structure, and at least a second temperature setpoint associated with the existence of occupants in the structure.

In addition, Claim 12 comprises one or more electronic devices having at least a graphic user interface comprising a display wherein the electronic devices receive input from one or more users and wherein use of the electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of the electronic devices by one or more users wherein activity of one or more networked electronic devices indicates whether the thermostat should be changed from the first temperature setpoint to the second temperature setpoint. The electronic devices and the thermostat are also connected to a network

Still further, Claim 12 comprises an application that in turn, comprises one or more computer processors in communication with the network. The application determines whether one or more of the electronic devices are in use and whether the thermostat is set to the first temperature setpoint that indicates the structure is not occupied. The application also provides electronic notice to one or more of the users of the electronic devices that the thermostat is set for a non-occupied structure and whether to keep the first temperature setpoint or change to the second temperature setpoint.

The thermostat is kept at the first temperature setpoint based upon user response to the electronic notice.

Application No.: 12/502,064**Filing Date: July 13, 2009**

Because the cited references fail to teach the combination of these concepts, Applicant respectfully submits that Claim 12 is patentably distinct from the cited references and Applicant respectfully requests allowance of Claim 12.

Claims 13-18 and 20-22

Claims 13-18 and 20-22 depend from Claim 12 and are believed to be patentable for the same reasons articulated above with respect to Claim 12, and because of the additional features recited therein.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/944,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,990 Now Pat. 7,908,117	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,949 Now Pat. 7,908,116	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/211,690 Published 2010/0070234	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat

Application No.: 12/502,064

Filing Date: July 13, 2009

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142 Published 2010/0262299	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg	12/502,064 Published 2010/0280667	07/13/09	EFACT.011A	System And Method For Using A Networked Electronic Device As An Occupancy Sensor For An Energy Management System
Steinberg et al.	12/773,690 Published 2010/0318227	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580 Published 2010/0282857	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052 Published 2010/0308119	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246 Pending	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821 Pending	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959,225 Pending	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	13/037,162 Pending	02/28/11	EFACT.004C1	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters

Application No.: 12/502,064

Filing Date: July 13, 2009

including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters.

Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing 14 new references. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Application No.: 12/502,064

Filing Date: July 13, 2009

CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 8-2-2011

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

11615590:ad
072011

Docket No.: EFACT.011A

Customer No. 20,995

INFORMATION DISCLOSURE STATEMENT

Applicant : John Douglas Steinberg
App. No : 12/502,064
Filed : July 13, 2009
For : SYSTEM AND METHOD FOR USING A
NETWORKED ELECTRONIC DEVICE AS AN
OCCUPANCY SENSOR FOR AN ENERGY
MANAGEMENT SYSTEM
Examiner : Robertson, David
Art Unit : 2121
Conf No. : 5514

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing fourteen (14) references.

This Information Disclosure Statement is being filed before the mailing date of a final action and before the mailing of a Notice of Allowance. This Statement is accompanied by the fees set forth in 37 C.F.R. § 1.17(p). The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 8-2-2011

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
(Multiple sheets used when necessary)	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	7,356,384	04-2008	Gull, et al.	
	2	7,784,704	08-31-2010	Harter	
	3	7,848,900	12-07-2010	Steinberg, John Douglas et al.	
	4	7,894,943	02-22-2011	Sloup et al.	
	5	2009/0240381	09-2009	Lane	
	6	2009/0281667	11-2009	Masui, et al.	
	7	2010/0019052	01-2010	Yip	
	8	2010/0070086	03-2010	Harrod, et al.	
	9	2010/0070089	03-2010	Harrod, et al.	
	10	2010/0070093	03-2010	Harrod, et al.	
	11	2010/0211224	08-2010	Keeling, et al.	
	12	2010/0235004	09-2010	Thind	
	13	2010/0289643	11-2010	Trundle, et al.	
	14	2011/0031323	02-2011	Nold, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

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08022011

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	0121 2252	1	245	245

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				425

Electronic Acknowledgement Receipt

EFS ID:	10652334
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/ThuyQuyen Nguyen
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011A
Receipt Date:	02-AUG-2011
Filing Date:	13-JUL-2009
Time Stamp:	18:32:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$425
RAM confirmation Number	5646
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0123(Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		EFACT-011A_response.pdf	479270 a0a0867712c80910d6f95085204b1e1a0b19f47	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	11	
Warnings:					
Information:					
2		EFACT-011A_ids.pdf	88752 107a81024f3d6a2d908b2d12d71d053d167a1061a	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
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Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			600576		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTD-585 (Rev. 07/09)

Approved for use through 10/1/2027 OMB 3500-0002
U.S. Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTD-575					Application or Ombuds Number 12/502,084		Filing Date 07/13/2009		<input type="checkbox"/> To be Mailed			
APPLICATION AS FILED - PART I												
(Column 1)			(Column 2)		SMALL ENTITY <input checked="" type="checkbox"/> OR		OTHER THAN SMALL ENTITY					
PCR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR		RATE (\$)	FEE (\$)				
<input type="checkbox"/> BASIC FEE (37 CFR 1.101(a), (b) or (c))	N/A	N/A	N/A	N/A			N/A	N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.102(a), (b) or (c))	N/A	N/A	N/A	N/A			N/A	N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.103(a), (b) or (c))	N/A	N/A	N/A	N/A			N/A	N/A				
TOTAL CLAIMS (37 CFR 1.103)	20	0	X \$	=			X \$	=				
INDEPENDENT CLAIMS (37 CFR 1.103)	2	0	X \$	=			X \$	=				
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.103)			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 38 U.S.C. 411(a)(1)(G) and 37 CFR 1.18(s).									
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.103)												
* If the difference in column 1 is less than zero, enter "0" in column 2.												
APPLICATION AS AMENDED - PART II												
(Column 1)			(Column 2)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY					
AMENDMENT	08/02/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR		RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.103)	20	N/A	22	X \$	0			X \$	=		
	Independent (37 CFR 1.103)	2	N/A	3	X \$	0			X \$	=		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.18(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.103)											
					TOTAL ADJ. FEE	0	OR		TOTAL ADJ. FEE			
(Column 1)			(Column 2)		(Column 3)				RATE (\$)	ADDITIONAL FEE (\$)		
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR			RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.103)	20	N/A	22	X \$				=	X \$	=	
	Independent (37 CFR 1.103)	2	N/A	3	X \$				=	X \$	=	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.18(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.103)											
					TOTAL ADJ. FEE		OR		TOTAL ADJ. FEE			
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.												
** If the "Highest Number Previously Paid For" in THIS SPACE is less than 20, enter "20".												
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".												
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.												

Legal Instrument Examiner:
REGINA D. BALTIMORE/

This collection of information is required by 37 CFR 1.14. The information is required to obtain or retain a benefit by the public which is to be paid by the USPTO to protect an invention. Confidentiality is governed by 38 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, reviewing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the nature of this you require to complete this form and/or suggestions for reducing the burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22315-1450. DO NOT SEND PAGES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22315-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	BEFACT011A	5514
20995 7590 03/03/2011 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER ROBERTSON, DAVID	
			ART UNIT	PAPER NUMBER
			2121	
			NOTIFICATION DATE	DELIVERY MODE
			03/03/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcarter@kmob.com
 cfiling@kmob.com
 cOAPilot@kmob.com

Office Action Summary	Application No.	Applicant(s)	
	12/502,064	STEINBERG, JOHN DOUGLAS	
	Examiner	Art Unit	
	Dave Robertson	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-18 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/7/2011</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This is a Non-final office action in response to Applicant's reply of 2/7/2011.

Claims 1-7, 9-18, and 20-22 are pending.

Response to Amendment

2. Applicant amends claims to further recite aspects of the invention regarding detection and actions taken upon determination of *non-occupancy* from user activity on a networked electronic device. These amendments raise questions as to indefiniteness under 35 U.S.C. 112, 2nd paragraph, however, a scheduled interview for Feb. 23, 2011, could not be conducted, and therefore remained unresolved as of the time for statutory response to the amendment filed 2/7/2011 in this special status application. As a courtesy to Applicant, the office action is made non-final. Examiner notes an indication of allowability of claims is per an interpretation taken for examination, however, amendment or clarification on the record will be required for final allowance given the issues raised by these amendments.

Response to Arguments

3. Applicant's arguments filed 2/7/2011 regarding amending claims filed 2/7/2011 are persuasive as to Williams et al. under 35 U.S.C. 102.

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Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1-7, 9-18, and 20-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear how the claimed method as recited achieves the desired outcome of *adjusting the temperature setpoint....based upon user response to said notice*. Claim 1 as presently amended recites:

A method for varying temperature setpoints for an HVAC system comprising:

- storing at least an HVAC temperature setting associated with a structure that is deemed to be non-occupied;
- determining whether one or more networked electronic devices inside said structure are in use, wherein said networked electronic devices comprise a graphic user interface comprising a display, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users;
- determining whether lack of said use of said networked electronic devices indicates non-occupancy of said structure;
- providing electronic notice to one or more of said users of said networked electronic devices of a determination of non-occupancy; and
- adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure to the HVAC temperature associated with a structure that is deemed to be non-occupied based upon user response to said notice.

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An interpretation of the method of claim 1 as recited in whole, and specifically to the limitation of *providing electronic notice to the one or more users of said networked electronic devices*, of which *devices* are recited in the antecedent as *inside said structure*, encompasses a step of providing electronic notice of non-occupancy to users of electronic devices residing within a structure determined, by lack of use, to be within a non-occupied structure. Claim 1 further recites *adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure to the HVAC temperature associated with a structure that is deemed to be non-occupied based upon user response to said notice*. It is therefore unclear how an electronic notification sent to an electronic device in an unoccupied structure can result in a response by a user, and therefore, indefinite as to what response the adjusting step is based. It is further unclear how a user could indicate a response (presumably using the electronic device to which the notice is sent) and not be deemed occupying the structure as a result of the use; and still further how, in the case of a plurality of users (said one or more users) of the one or more networked electronic devices, an electronic notice could be sent to the user of a corresponding device (if such user could in fact both occupy and not occupy the structure in which a particular electronic device resides) without identification of the particular user and networked device.

Claims are interpreted in light of the specification. Looking to the specification as originally filed (see pages 10-12, ¶[0039-0041]) provides no further clue as to how the method would operate to receive a response from a user to a notification to the networked electronic device when the structure in which both user and device reside

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are *unoccupied*. There is no apparent disclosure of an alternative electronic device for receiving the electronic notice or any disclosed acts or means of directing the notification to an alternative device that is *not* in the unoccupied structure (see e.g. Figure 2 and related description). Rather, looking to the detailed description and the flowchart in Figure 7, there appears to *require* a response to the "requesting action" (the electronic notification) to perform the *adjusting...* step of the method.

Claim 12 recites a system implementing the method of claim 1. Claims 2-7, 9-11, 13-18, and 20-22 depend from claims 1 or 12 and are similarly deficient. Claims 5 and 12 however, by identification of the user by usage pattern, are reasonably clear on the point of which networked electronic device to send the notice because the user of the one or more users may be identified.

For the purposes of examination, the interpretation taken will be as claimed and disclosed, that of *adjusting the temperature setpoint...based upon user response to said notice* and *requiring* a user response to the notification before adjusting the temperature setpoint of the unoccupied structure. The present disclosure appears to support the claim as recited and interpreted, however, the disclosure does not appear to disclose an action taken in the absence of a user response, and therefore how an adjustment can be made if the user no longer occupies the structure housing the networked device to which the electronic notification of non-occupancy is provided.

Applicant is advised however that this interpretation taken for examination on the merits does not waive the written description requirement that claim amendments must be fully supported and enabled by the original disclosure.

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Allowable Subject Matter

6. Notwithstanding the above Examiner comments under *Response to Amendments*, claims 1-7, 9-18, and 20-22 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action, pending final search and consideration after amendments and/or arguments curing of the points of indefiniteness raised above. The reasons for indicating allowable subject matter would be as follows:

The closest prior art **Podgorny et al. (US 2008/0281472)** teaches a method and system substantially as recited in claims 1 and 12, expressly including a graphical user interface (the "Personalization Interface GUI") capable of receiving notifications (from the "Notification Agent") for displaying and setting current environmental settings and preferences (see Table 3, page 28 "User's Interface"), user setting of environmental preferences (Table 3, page 27 "Environmental Model"), and setting an HVAC temperature associated with a structure that is deemed to be non-occupied (see ¶[0201]).

However, Podgorny et al. does not expressly teach ***adjusting the temperature setpoint...to the HVAC temperature associated with a structure that is deemed to be non-occupied based upon user response to said notice [of determination of non-occupancy]***. That is, Podgorny et al. does not teach, as claimed and disclosed by the present invention (as explained in section 35 U.S.C. 112 above) *requiring* a user response to adjust the HVAC temperature associated with a structure deemed to be

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non-occupied upon electronic notification of non-occupancy to the user of the networked electronic device residing in the unoccupied structure.

While Podgorny et al. teaches a Personalized Web UI (user interface) and a Presence Detector capable of prompting a user in response to a detection of non-occupancy, Podgorny et al., alone or in view of the prior art of record, does not teach or fairly suggest adjusting the temperature setpoint within a structure that is deemed to be non-occupied based upon user response to said notice of non-occupancy. Contrary to common sense, it would not be obvious to one of ordinary skill in art to require a user of a networked device residing in a structure deemed to be unoccupied, to respond to a notification of non-occupancy in order to set an HVAC temperature associated with non-occupancy of the structure. Rather, one of ordinary skill in the art would assume that a determination of non-occupancy implies that the user is not present to respond to a notification, and therefore (as in Podgorny et al. ¶[0201]) simply “turn down the temperature” without requiring a user response. To require a user response to “turn down the temperature” when the structure is deemed unoccupied would defeat the purpose of the “Smart Building System” or any such system that saved energy by reducing heating when buildings or zones of buildings are deemed unoccupied.

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Conclusion

7. The prior art made of record and listed on the attached PTO Form 892 but not relied upon is considered pertinent to applicant's disclosure.

Wacker et al. (US 7,055,759) teaches user-controlled networked-device enabled setting and control of environmental settings including temperature settings for occupied and unoccupied buildings.

Examiner believes prosecution would be advanced by Interview following receipt of the office action above and review of the cited art of record and comments above.

The Examiner may be reached at the telephone number indicated below.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on Weekdays 8:15 am to 4:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dave Robertson/
Examiner, Art Unit 2121

Notice of References Cited	Application/Control No. 12/502,064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS	
	Examiner Dave Robertson	Art Unit 2121	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,055,759 B2	06-2006	Wacker et al.	236/51
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes *1250206 4*	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

SEARCHED

Class	Subclass	Date	Examiner
700	276	9/28/2010	dcr
62	176.6	2/26/2011	dcr
236	46R	2/26/2011	dcr
700	276, 278, 295, 296	2/26/2011	dcr

SEARCH NOTES

Search Notes	Date	Examiner
EAST (USPAT, PgPUB, Derwent - see complete search history in application file)	9/29/2010	dcr
"236"/\$ "700"/\$ "340"/\$ (text-limited and cross-classification search - see search history)	9/28/2010	dcr
EAST (updated)	2/26/2011	dcr

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

/Dave Robertson/
Examiner, Art Unit 2121

14-00000 Search History (Prior Art)

0439

S107	2	((television or TV) or video) (channel or media or program \$4 or content)) ((unoccup\$3 or occupied or occupancy or presence) (detect\$ or determin\$ or recogniz\$); ((who\$ or person or user or individual or viewer or occupant or identity) (identifi\$ or recogni\$7 or determin\$ or detect\$))) and S106	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/19 14:30
S106	2	"5977964".on.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30
S105	105	(temperature or thermostat or environment\$2 or HVAC) or heating or cooling) with (control \$4 or setting or set\$1point) and S104	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30
S104	675	((television or TV) or video) with (channel or media or program\$4 or content)) same ((unoccup\$3 or occupied or occupancy or presence) with (detect\$ or determin\$ or recogniz\$); same ((who\$ or person or user or individual or viewer or occupant or identity) with (identifi\$ or recogni\$7 or determin\$ or detect\$)))	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30
S103	1218	((television or TV) or video) with (channel or media or program\$4 or content)) same ((unoccup\$3 or occupied or occupancy or presence)) same ((who\$ or person or user or individual or viewer or occupant or identity) with (identifi\$ or recogni\$7 or determin\$ or detect\$)))	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30
S102	0	(11/183602) APF.	USPAT; USCOR	ADJ	ON	2011/02/19 14:30
S101	55	(US-20090125151-\$ or US-20090069699-\$ or US-20100123560-\$ or US-20100019051-\$ or US-20090284344-\$ or US-20090140836-\$ or US-20080261472-\$ or US-20070146126-\$ or US-20070040672-\$ or US-20070008149-\$ or US-20060267750-\$ or US-20040155781-\$ or US-20100156608-\$ or US-20100138007-\$ or US-20090055403-\$ or US-	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30

1. 2019年12月31日，公司总资产为1,000,000,000.00元，净资产为500,000,000.00元，营业收入为1,200,000,000.00元，净利润为100,000,000.00元。

0442

S79	13	(unoccup\$3 or occup\$3 or occupancy); and S77	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/19 14:30
S79	213936	("236"/\$ "700"/\$ "340"/\$).cda.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/19 14:30
S77	31	("236"/\$ "700"/\$ "340"/\$).cda.	US-PGPUB; USPAT; DERWENT	AND	ON	2011/02/19 14:30
S79	424	700/276.cdr.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:30
S79	57	"20090009600" "20090125151" "4403644" "4674027" "5572439" "5717609" "6145751" "6178362" "6351693" "6400896" "6437692" "6480803" "6526675" "6642076" "6549130" "6574537" "6594825" "6695430" "6596058" "6819555" "6622007" "6622825" "6622926" "6629937" "6633623" "6843567" "6671586") .FN.	US-PGPUB; USPAT; USCOR; DERWENT	ADJ	ON	2011/02/19 14:30
S74	59	(LJCHN) near2 (STEINBERG). INV.	US-PGPUB; USPAT	ADJ	ON	2011/02/19 14:30
S79	1	"61134714".rlan. or ("61".src. and "134714".ap.)	US-PGPUB; USPAT; USCOR; DERWENT	ADJ	ON	2011/02/19 14:30
S72	1	"12502064".rlan. or ("12".src. and "502064".ap.)	US-PGPUB; USPAT; USCOR; DERWENT	ADJ	ON	2011/02/19 14:30
S118	14	(US-20060281472-\$ or US- 20100156608-\$ or US- 20100162285-\$ or US- 20090052853-\$ or US- 20060045105-\$ or US- 20070146126-\$) did. or (US- 5377964-\$ or US-5682949-\$ or US-H002176-\$ or US-7061390- \$ or US-7260823-\$ or US- 7242988-\$ or US-7483984-\$ or US-6912429-\$) did.	US-PGPUB; USPAT	ADJ	ON	2011/02/19 14:37

SI 17	80	(US-20090125151-\$ or US- 20090099689-\$ or US- 20100123560-\$ or US- 20100019051-\$ or US- 20090284344-\$ or US- 20090140838-\$ or US- 20080281472-\$ or US- 20070146126-\$ or US- 20070040672-\$ or US- 20070008149-\$ or US- 20060267780-\$ or US- 20040155761-\$ or US- 20100156608-\$ or US- 20100138007-\$ or US- 20090055403-\$ or US- 20060283658-\$ or US- 20040178889-\$ or US- 20040201003-\$ or US- 20100162255-\$ or US- 20090293079-\$ or US- 20090147772-\$ or US- 20090052859-\$ or US- 20060045105-\$) did. or (US- 6912420-\$ or US-6851621-\$ or US-5682949-\$ or US-6145751-\$ or US-6002176-\$ or US- 6549130-\$ or US-6542076-\$ or US-6351693-\$ or US-6549816-\$ or US-6671586-\$ or US- 6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622926-\$ or US-6622925-\$ or US- 6622067-\$ or US-6610555-\$ or US-6598056-\$ or US-6595430-\$ or US-6594825-\$ or US- 6674537-\$ or US-6538675-\$ or US-6480903-\$ or US-6437692-\$ or US-6400996-\$ or US- 6178362-\$) did. or (US- 5717609-\$ or US-5572438-\$ or US-4674027-\$ or US-4408644-\$ or US-7354005-\$ or US- 7392042-\$ or US-7248170-\$ or US-7027617-\$ or US-6633223-\$ or US-7061393-\$ or US- 6977964-\$ or US-7260823-\$ or US-7242958-\$ or US-7453964-\$ or US-6640145-\$ or US- 6419424-\$ or US-7706928-\$ or US-7702421-\$ or US-7644868-\$ or US-6260765-\$ or US- 5818347-\$ or US-5555027-\$ or US-5544038-\$ or US-5452225-\$ or US-5314004-\$ or US- 5270952-\$ or US-5244146-\$) did. or (US-4855279-\$ or US- 4341345-\$ or US-4136732-\$) did. or (WC-2009089928-\$). did.	US-PS/PUB; USFAT; DERWENT	ACU	ON	2011/02/19 14:37
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SI19	0	SI18 and (non\$1occup\$)	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:38
SI20	0	SI17 and (non\$1occup\$)	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/19 14:39
SI24	16	(unoccup\$3 or non\$1occup\$4) and SI23	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 13:59
SI23	63	(US-20090125151-\$ or US- 20090090659-\$ or US- 20100162265-\$ or US- 20100158608-\$ or US- 20090052859-\$ or US- 20080281472-\$ or US- 20070146128-\$ or US- 20060045105-\$) did. or (US- 6671588-\$ or US-6643567-\$ or US-6633523-\$ or US-6628997-\$ or US-6622628-\$ or US- 6622925-\$ or US-6622097-\$ or US-6618555-\$ or US-6598056-\$ or US-6595430-\$ or US- 6594825-\$ or US-6574537-\$ or US-6549130-\$ or US-6542076-\$ or US-6536675-\$ or US- 6480803-\$ or US-6437692-\$ or US-6400996-\$ or US-6351690-\$ or US-6178362-\$ or US- 6145781-\$ or US-617609-\$ or US-5572438-\$ or US-4674027-\$ or US-4403644-\$ or US- 7644869-\$) did. or (US- 6260765-\$ or US-5818347-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US- 5314004-\$ or US-5270932-\$ or US-5244146-\$ or US-4655279-\$ or US-4341945-\$ or US- 4139732-\$ or US-7483864-\$ or US-7260823-\$ or US-7242986-\$ or US-H002178-\$ or US- 7061390-\$ or US-6912429-\$ or US-5977964-\$ or US-5852949-\$) did.	US-PGPUB; USPAT	ADJ	ON	2011/02/24 13:59
SI25	0	(unoccup\$3 or non\$1occup\$4) with (notice or prompt or message or confirm\$5) and SI23	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:01
SI25	472	(unoccup\$3 or non\$1occup\$4) with (notice or prompt or message or confirm\$5)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:01
SI29	12	(unoccup\$3 or non\$1occup\$4) and (notice\$2 or prompt\$2 or message\$3 or confirm\$5) and SI23	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:02

S126	0	(unoccu\$3 or non\$1occu\$4) same (notic\$2 or prompt\$3 or messag\$3 or confir\$5) and S123	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:02
S127	0	(unoccu\$3 or non\$1occu\$4) with (notic\$2 or prompt\$3 or messag\$3 or confir\$5) and S123	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:02
S130	60	("5882949").URPN.	USPAT	ADJ	ON	2011/02/24 14:05
S132	2	S131 not S129	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:08
S131	14	(unoccu\$3 or non\$1occu\$4) and (notic\$2 or not\$7 or prompt\$3 or messag\$3 or confir\$5) and S123	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:08
S133	19	("6912429").URPN.	USPAT	ADJ	ON	2011/02/24 14:10
S134	14	(unoccu\$3 or non\$1occu\$4) and (notic\$2 or not\$7 or prompt\$3 or messag\$3 or confir\$5 or user near input\$3) and S123	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:14
S135	84	("6549190").URPN.	USPAT	ADJ	ON	2011/02/24 14:15
S137	22	(unoccu\$3 or non\$1occu\$4) and (notic\$2 or not\$7 or prompt\$3 or messag\$3 or confir\$5 or user near input\$3) and S136	US-PGRUB; USPAT; DERWENT	OR	ON	2011/02/24 14:20
S136	67	(US-20090125151-\$ or US-20090099699-\$ or US-20100123560-\$ or US-20100019051-\$ or US-20090264344-\$ or US-20090140838-\$ or US-20080281472-\$ or US-20070148126-\$ or US-20070040672-\$ or US-20070008149-\$ or US-20060267780-\$ or US-20040155781-\$ or US-20100158608-\$ or US-20100138007-\$ or US-20090055400-\$ or US-20060263938-\$ or US-20040178859-\$ or US-20040201000-\$ or US-20100162255-\$ or US-20090293079-\$ or US-20090147772-\$ or US-20090082853-\$ or US-20060045105-\$) did. or (US-6912429-\$ or US-6951821-\$ or US-5882949-\$ or US-6145751-\$	US-PGRUB; USPAT; DERWENT	ADJ	ON	2011/02/24 14:20

		or US-6002178-\$ or US-6549130-\$ or US-6542076-\$ or US-6351693-\$ or US-6549818-\$ or US-6671566-\$ or US-6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622926-\$ or US-6622925-\$ or US-6622057-\$ or US-6619555-\$ or US-6598056-\$ or US-6595430-\$ or US-6594825-\$ or US-6574537-\$ or US-6536675-\$ or US-6480803-\$ or US-6437852-\$ or US-6400996-\$ or US-6178362-\$) did. or (US-6717609-\$ or US-5872438-\$ or US-4674027-\$ or US-4403644-\$ or US-7354005-\$ or US-7392042-\$ or US-7248170-\$ or US-7027617-\$ or US-6633223-\$ or US-7061390-\$ or US-5977964-\$ or US-7260823-\$ or US-7242998-\$ or US-7463964-\$ or US-6640145-\$ or US-6416424-\$ or US-7706929-\$ or US-7702421-\$ or US-7644869-\$ or US-6260765-\$ or US-5818247-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US-5314004-\$ or US-5270952-\$ or US-5244146-\$). did. or (US-4655278-\$ or US-4341345-\$ or US-4138732-\$ or US-7505402-\$ or US-7567464-\$ or US-7690703-\$ or US-7657636-\$ or US-7455236-\$ or US-7421727-\$ or US-7156316-\$) did. or (WO-2009068995-\$). did.				
S138	10	(unoccu\$3 or non\$1occu\$4) same (notic\$2 or notit\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3) and S136	US-PGPUB, USPAT, DERWENT	OR	ON	2011/02/24 14:26
S139	1	"12502064".ran. or ("12".src. and "502064".ap.)	US-PGPUB, USPAT, USOCR, DERWENT	ADJ	ON	2011/02/24 14:31
S141	8	("20060283621" "5261481" "5476221" "6186468").PN.	US-PGPUB, USPAT, USOCR, DERWENT	ADJ	ON	2011/02/24 14:33
S140	1	"12177822".ran. or ("12".src. and "177822".ap.)	US-PGPUB, USPAT, USOCR, DERWENT	ADJ	ON	2011/02/24 14:33
S142	1	("5261481").UPPN.	USPAT	ADJ	ON	2011/02/24 14:36
S143	137	62/176.6.cnr.	US-PGPUB, USPAT, DERWENT	ADJ	ON	2011/02/24 14:37

S145	4756	(unoccup\$3 or non\$1occup\$4 or occupied) with (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	ON	ON	2011/02/24 14:39
S146	655	(unoccup\$3 or non\$1occup\$4) with (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7)	US-PGPUB; USPAT; DERWENT	ON	ON	2011/02/24 14:39
S144	10	(unoccup\$3 or non\$1occup\$4) same (notic\$2 or notif\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verif\$7) and S136	US-PGPUB; USPAT; DERWENT	ON	ON	2011/02/24 14:39
S149	11	(S147 or S148) and S146	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/24 14:40
S149	63	(US-20090125151-\$ or US-200900990699-\$ or US-20100162285-\$ or US-20100156609-\$ or US-20090052859-\$ or US-20080281472-\$ or US-20070146126-\$ or US-20060045105-\$) did. or (US-6671566-\$ or US-6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622826-\$ or US-6622825-\$ or US-6622097-\$ or US-6619855-\$ or US-6698056-\$ or US-6595430-\$ or US-6594825-\$ or US-6574537-\$ or US-6549130-\$ or US-6542076-\$ or US-6536675-\$ or US-6480803-\$ or US-6437882-\$ or US-6400996-\$ or US-6351693-\$ or US-6178362-\$ or US-6145761-\$ or US-6717609-\$ or US-5572438-\$ or US-4674027-\$ or US-4403644-\$ or US-7644869-\$) did. or (US-6280765-\$ or US-5818347-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US-5314004-\$ or US-5270852-\$ or US-5244148-\$ or US-4655879-\$ or US-4341345-\$ or US-4136732-\$ or US-7483864-\$ or US-7260823-\$ or US-7242988-\$ or US-H002176-\$ or US-7061393-\$ or US-6912429-\$ or US-6977964-\$ or US-5682949-\$) did.	US-PGPUB; USPAT	ADJ	ON	2011/02/24 14:40

2147	90	(US-20090125151-\$ or US- 20090099099-\$ or US- 20100123560-\$ or US- 20100019051-\$ or US- 20090284344-\$ or US- 20080140838-\$ or US- 20080281472-\$ or US- 20070146128-\$ or US- 20070040672-\$ or US- 20070008149-\$ or US- 20080267780-\$ or US- 20040155781-\$ or US- 20100156608-\$ or US- 20100138007-\$ or US- 20090055403-\$ or US- 20080253938-\$ or US- 20040178889-\$ or US- 20040231003-\$ or US- 20100162865-\$ or US- 20090293079-\$ or US- 20090147772-\$ or US- 20090052859-\$ or US- 20060045105-\$) did. or (US- 8912429-\$ or US-8851621-\$ or US-5582949-\$ or US-6145751-\$ or US-H002176-\$ or US- 6549130-\$ or US-6542076-\$ or US-6351693-\$ or US-6549815-\$ or US-6671586-\$ or US- 6643567-\$ or US-6633823-\$ or US-6628997-\$ or US-6622926-\$ or US-6622925-\$ or US- 6622067-\$ or US-6618555-\$ or US-6598058-\$ or US-6595430-\$ or US-6594825-\$ or US- 6574537-\$ or US-6566675-\$ or US-6480603-\$ or US-6437692-\$ or US-6400996-\$ or US- 6178362-\$) did. or (US- 5717809-\$ or US-5572438-\$ or US-4674027-\$ or US-4403644-\$ or US-7254005-\$ or US- 7392042-\$ or US-7248170-\$ or US-7027617-\$ or US-6833223-\$ or US-7061393-\$ or US- 5977964-\$ or US-7280823-\$ or US-7242958-\$ or US-7453964-\$ or US-6640145-\$ or US- 6419424-\$ or US-7706928-\$ or US-7702421-\$ or US-7644889-\$ or US-6260765-\$ or US- 5518347-\$ or US-5835827-\$ or US-5544036-\$ or US-5452225-\$ or US-5314004-\$ or US- 5270952-\$ or US-5244146-\$). did. or (US-4655279-\$ or US- 4341345-\$ or US-4136732-\$ or US-7509402-\$ or US-7597464-\$ or US-7590793-\$ or US- 7857638-\$ or US-7455236-\$ or	US-PGPUB; USPAT; DERWENT	ACJ	ON	2011/02/24 14:40
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		US-7421727-\$ or US-7158318-\$ or US-5281481-\$ or US-7783510-\$) did. or (WO-2009069998-\$ or US-8198468-\$) did.				
St53	0	(12/041472).APP.	USPAT; USOOP	ADJ	ON	2011/02/24 14:53
St52	6	St51 and St50	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:53
St51	11543	(unoccup\$3 or non\$1occup\$4 or occupied) same (notic\$2 or notit\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verit\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:53
St50	17	(US-20090052859-\$ or US-20080281472-\$ or US-20100158606-\$ or US-20100162255-\$ or US-20060045105-\$ or US-20080259021-\$) did. or (US-5977964-\$ or US-5281481-\$ or US-8594825-\$ or US-5682949-\$ or US-6002178-\$ or US-7354005-\$ or US-7061393-\$ or US-7200823-\$ or US-7242986-\$ or US-7463964-\$ or US-8351693-\$) did.	US-PGPUB; USPAT	ADJ	ON	2011/02/24 14:53
St55	6	St54 and St50	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:55
St54	205997	(unoccup\$3 or non\$1occup\$4 or occupied or presence) same (notic\$2 or notit\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verit\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/24 14:55
St56	0	(12/041472).APP.	USPAT; USOOP	ADJ	ON	2011/02/26 13:54
St59	32	St57 and St58	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/26 13:55
St58	206013	(unoccup\$3 or non\$1occup\$4 or occupied or presence) same (notic\$2 or notit\$7 or prompt\$3 or messag\$3 or confirm\$5 or user near input\$3 or validat\$3 or verit\$7)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/02/26 13:55

0.51%

0452

0453

		5717609-\$ or US-5572438-\$ or US-4674027-\$ or US-4403644-\$ or US-7354005-\$ or US-7392042-\$ or US-7248170-\$ or US-7027617-\$ or US-6633223-\$ or US-7061393-\$ or US-5977964-\$ or US-7260823-\$ or US-7242988-\$ or US-7483964-\$ or US-6640145-\$ or US-6418424-\$ or US-7706928-\$ or US-7702421-\$ or US-7644869-\$ or US-6260765-\$ or US-5818347-\$ or US-5555927-\$ or US-5544036-\$ or US-5462225-\$ or US-5314004-\$ or US-5270952-\$ or US-5244146-\$). did. or (US-4655279-\$ or US-4341345-\$ or US-4136732-\$ or US-7509402-\$ or US-7587464-\$ or US-7590703-\$ or US-7657636-\$ or US-7455236-\$ or US-7421727-\$ or US-7156316-\$ or US-5261481-\$ or US-7793510-\$ or US-7055759-\$). did. or (WO-2009069998-\$ or US-6196468-\$).did.				
L9	0	((prompt\$3 or ask\$3) same I2) and I5	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/26 19:15
L8	10561	((prompt\$3 or ask\$3) same I2)	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/26 19:15
L12	0	"are you there"	US-PGPUB; USPAT; DERWENT	ADJ	ON	2011/02/26 19:18

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S122	25	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity) with (identify or recognize))) .ti,ab,clm.	UPAD	OR	ON	2011/02/19 14:30
S121	216	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity) with (identify or recognize)))	UPAD	OR	ON	2011/02/19 14:30

2/ 26/ 2011 8:03:17 PM

C:\Documents and Settings\drobertson2\My Documents\EAST\Workspaces\12502064 Steinberg energy use monitor tv viewing habits.wsp

Index of Claims *1250206 4*	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIM		DATE					
Final	Original	08/28/2010	02/28/2011				
	1	✓	✓				
	2	✓	✓				
	3	✓	✓				
	4	✓	✓				
	5	✓	✓				
	6	✓	✓				
	7	✓	✓				
	8	✓	✓				
	9	✓	✓				
	10	✓	✓				
	11	✓	✓				
	12	✓	✓				
	13	✓	✓				
	14	✓	✓				
	15	✓	✓				
	16	✓	✓				
	17	✓	✓				
	18	✓	✓				
	19	✓	✓				
	20	✓	✓				
	21	✓	✓				
	22	✓	✓				

Receipt date: 02/07/2011

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,136,732	01-1979	Demaray et al.	
	2	4,341,345	07-1982	Hammer et al.	
	3	4,655,279	04-1987	Harmon	
	4	5,244,146	09-1993	Jefferson et al.	
	5	5,270,952	12-1993	Adams et al.	
	6	5,314,004	05-1994	Strand et al.	
	7	5,462,225	10-1995	Massara et al.	
	8	5,544,036	08-1996	Brown et al.	
	9	5,555,927	09-1996	Shah	
	10	5,818,347	10-06-1998	Dolan et al.	
	11	6,260,765	07-2001	Nataie et al.	
	12	7,644,869	01-2010	Hoglund et al.	
	13	2009/0099699 A1	04-16-2009	Steinberg et al.	
	14	2009/0125151 A1	05-14-2009	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	15	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome 2004	
	16	Honeywell, "W7600/W7620 Controller Reference Manual, HW0021207, October, 1992	

10651795:ad
020411

Examiner Signature	/Dave Robertson/ (02/17/2011)	Date Considered	02/17/2011
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DCR/

EFACT.011A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Douglas Steinberg
App. No	: 12/502,064
Filed	: July 13, 2009
For	: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: David Robertson
Art Unit	: 2121
Conf No.	: 5514

RESPONSE TO OCTOBER 7, 2010 OFFICE ACTION

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed October 7, 2010, Applicant respectfully submits the following amendments and comments.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Summary of Interview begins on page 6 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Application No.: 12/502,064

Filing Date: July 13, 2009

AMENDMENTS TO THE CLAIMS

Please amend Claims 1-7, 9, 10, 12-18 and 21 as indicated below.

1. (Currently Amended) A method for varying temperature setpoints for an HVAC system comprising:

storing at least an HVAC temperature setting associated with a structure that is deemed to be non-occupied;

determining whether one or more networked electronic devices inside [[a]] said structure are in use, wherein said networked electronic devices comprise a graphic user interface comprising a display, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users;

determining whether lack of said use of said networked electronic devices indicates non-occupancy of said structure;

providing electronic notice to one or more of said users of said networked electronic devices of a determination of non-occupancy; and

adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure to the HVAC temperature associated with a structure that is deemed to be non-occupied based upon user response to said notice ~~whether or not said structure is deemed to be occupied.~~

2. (Currently Amended) The method of Claim 1 in which at least one of said networked electronic device devices is a television.

3. (Currently Amended) The method of Claim 1 in which at least one of said networked electronic device devices is a personal computer.

4. (Currently Amended) The method of Claim 1 in which at least one of said networked electronic device devices is connected to the Internet.

Application No.: 12/502,064

Filing Date: July 13, 2009

5. (Currently Amended) The method of Claim 1 in which programming being watched or listened to using at least one of said networked electronic device devices is used to determine which occupant of said structure is likely to be present, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one networked electronic device.

6. (Currently Amended) The method of Claim 1 in which at least one of said networked electronic device devices is a game console.

7. (Currently Amended) The method of Claim 1 in which at least one of said networked electronic device devices communicates with a remote server.

8. (Canceled)

9. (Currently Amended) The method of Claim 1 in which said adjusting of said temperature ~~setpoints~~ setpoint is initiated by a remote computer.

10. (Currently Amended) The method of Claim 1 in which said temperature ~~setpoints are~~ setpoint is varied automatically.

11. (Original) The method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said temperature setpoint.

12. (Currently Amended) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least one temperature setting associated with the presence of one or more occupants in a structure, and at least one temperature setting associated with the absence of occupants in said structure;

one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users, and

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wherein lack of said use of said electronic devices indicates non-occupancy of said structure;

wherein said electronic devices and said thermostat are connected to a network;

an application comprising one or more computer processors in communication with said network, wherein said application provides electronic notice to one or more of said users of said electronic devices of a determination of non-occupancy; and

wherein said setpoint on said thermostat is adjusted ~~between~~ from said temperature setting associated with the presence of one or more occupants in said structure and to said temperature setting associated with the absence of occupants in said structure based upon user response to said notice ~~the use of said user interface for said electronic device.~~

13. (Currently Amended) The system of Claim 12 in which at least one of said electronic device devices is a television.

14. (Currently Amended) The system of Claim 12 in which at least one of said electronic device devices is a personal computer.

15. (Currently Amended) The system of Claim 12 in which at least one of said electronic device devices is connected to the Internet.

16. (Currently Amended) The system of Claim 12 in which the programming being watched or listened to using said ~~networked~~ electronic device devices is used to determine which occupant of said structure is likely to be using at least one of said networked electronic device devices, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said at least one networked electronic device.

17. (Currently Amended) The system of Claim 12 in which at least one of said networked electronic device devices is a game console.

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18. (Currently Amended) The system of Claim 12 in which at least one of said ~~networked electronic device~~ devices communicates with a remote server.

19. (Canceled)

20. (Original) The system of Claim 12 in which variation of temperature setpoints is initiated by a remote computer.

21. (Currently Amended) The system of Claim 12 in which said temperature ~~setpoints are~~ setpoint is varied automatically.

22. (Original) The system of Claim 12 in which an occupant is prompted to confirm occupancy prior to adjustment of said temperature setpoint.

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SUMMARY OF INTERVIEW

Attendees, Date and Type of Interview

The telephonic interview was conducted on December 17, 2010 and attended by Examiner David Robertson, John R. King and John Steinberg.

Exhibits and/or Demonstrations

None.

Identification of Claims Discussed

Claim 1.

Identification of Prior Art Discussed

U.S. Patent No. 5,977,864 to Williams, et al.

Proposed Amendments

See the amendments made to Claim 1 as set forth above.

Principal Arguments and Other Matters

See the remarks made with respect to Claim 1 as set forth below.

Results of Interview

It was Applicant's understanding that Examiner Robertson would further review the amendments upon submission of this response.

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REMARKS

The October 7, 2010 Office Action was based upon pending Claims 1-7, 9-18 and 20-22. This Amendment amends Claims 1-7, 9, 10, 12-18 and 21. Thus, after entry of this Amendment, Claims 1-7, 9-18 and 20-22 are pending and presented for further consideration.

REJECTION OF CLAIMS 1-7, 9-18 AND 20-22 UNDER 35 U.S.C. § 102(b)

Claims 1-7, 9-18 and 20-22 under were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,977,864 to Williams, et al. (hereinafter "Williams").

Claim 1

As discussed in the interview, Williams does not 1) monitor usage of a networked electronic device to determine non-occupancy, 2) provide electronic notice of non-occupancy and 3) alter the HVAC temperature to a setpoint for non-occupancy based on user response to the notice.

Because Williams fails to teach these concepts, Applicant respectfully submit that amended Claim 1 is patentable in light of Williams.

Claims 2-7 and 9-11

Claims 2-7 and 9-11 depend from Claim 1 and are believed to be patentable for the same reasons articulated above with respect to Claim 1, and because of the additional features recited therein.

Claim 12

Independent Claim 12 is of different scope than the other independent claims and Applicant requests the Examiner to separately evaluate the patentability of Claim 12 in light of the arguments set forth below.

In particular, Claim 12 is directed to a system for altering the setpoint on a thermostat for space conditioning of a structure comprising at least one thermostat

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having at least one temperature setting associated with the presence of one or more occupants in a structure, and at least one temperature setting associated with the absence of occupants in said structure.

In addition, Claim 12 comprises one or more electronic devices having at least a graphic user interface comprising a display. The networked electronic devices receive input from one or more users. Also, use of the networked electronic devices comprises at least one of cursor movement, keystrokes or other user interface actions intended to alter a state of one or more of said electronic devices by one or more users.

Lack of use of said networked electronic devices indicates non-occupancy of said structure.

Furthermore, the networked electronic devices, the thermostat and an application comprising one or more computer processors are in communication with a network. The application provides electronic notice to one or more of said users of said networked electronic devices of a determination of non-occupancy.

Moreover, the setpoint on said thermostat is adjusted from said temperature setting associated with the presence of one or more occupants in said structure to said temperature setting associated with the absence of occupants in said structure based upon user response to said notice.

Because Williams fails to teach these concepts, Applicant respectfully submits that Claim 12 is patentably distinct from the cited references and Applicant respectfully requests allowance of Claim 12.

Claims 13-18 and 20-22

Claims 13-18 and 20-22 depend from Claim 1 and are believed to be patentable for the same reasons articulated above with respect to Claim 1, and because of the additional features recited therein.

Application No.: 12/502,064

Filing Date: July 13, 2009

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/944,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,990	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,949	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/211,733 Now Pat. 7,848,900	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/211,690	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An HVAC System
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,657 Now Expired	05/08/09	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	12/773,690	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption

Application No.: 12/502,064

Filing Date: July 13, 2009

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	12/778,052	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System
Steinberg	12/860,821	08/20/10	EFACT.013A	System And Method For Optimizing Use Of Plug-In Air Conditioners And Portable Heaters
Steinberg et al.	12/959225	12/02/10	EFACT.005C1	System And Method For Calculating The Thermal Mass Of A Building

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit copies these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters.

Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing 16 new references. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

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Filing Date: July 13, 2009

NO DISCLAIMERS OR DISAVOWALS

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

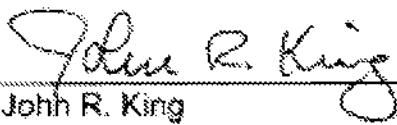
CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested. Also, please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 2-7-2011

By: 
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

10240193-01 020411

Docket No.: EFACT.011A

Customer No. 20995

INFORMATION DISCLOSURE STATEMENT

Applicant : John Douglas Steinberg
App. No : 12/502,064
Filed : July 13, 2009
For : SYSTEM AND METHOD FOR USING A NETWORKED
ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR
AN ENERGY MANAGEMENT SYSTEM
Examiner : Robertson, David
Art Unit : 2121
Conf No. : 5514

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing sixteen (16) references, of which two (2) are enclosed/submitted.

This Information Disclosure Statement is being filed before the mailing date of a final action and before the mailing of a Notice of Allowance. This Statement is accompanied by the fees set forth in 37 C.F.R. § 1.17(p). The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 2-7-2011

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20995
(949) 760-0404

10654490:ad
020711

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	2121
	Examiner	Robertson, David
SHEET 1 OF 1	Attorney Docket No.	EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,136,732	01-1979	Demaray et al.	
	2	4,341,345	07-1982	Hammer et al.	
	3	4,655,279	04-1987	Harmon	
	4	5,244,146	09-1993	Jefferson et al.	
	5	5,270,952	12-1993	Adams et al.	
	6	5,314,004	05-1994	Strand et al.	
	7	5,462,225	10-1995	Massara et al.	
	8	5,544,036	08-1996	Brown et al.	
	9	5,555,927	09-1996	Shah	
	10	5,818,347	10-06-1998	Dolan et al.	
	11	6,260,765	07-2001	Nataie et al.	
	12	7,644,869	01-2010	Hoglund et al.	
	13	2009/0099699 A1	04-16-2009	Steinberg et al.	
	14	2009/0125151 A1	05-14-2009	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	15	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome	
	16	Honeywell, "W7600/W7620 Controller Reference Manual, HW0021207, October, 1992	

10651795:ad
020411

Examiner Signature	Date Considered
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***Examiner:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	EFACT.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with \$0 paid	0170 2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				245

Electronic Acknowledgement Receipt

EFS ID:	9386615
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Quyen Lieu
Filer Authorized By:	John R. King
Attorney Docket Number:	EFACT.011A
Receipt Date:	07-FEB-2011
Filing Date:	13-JUL-2009
Time Stamp:	17:43:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 245
RAM confirmation Number	4692
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 01172(Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	NPL Documents	EFACT-011A_REF15.pdf	2407105 c10/995c568/4/0d15/aa2ca1d8c195a01a0ca80/	no	64
Warnings:					
Information:					
2	NPL Documents	EFACT-011A_REF16.pdf	1761303 af5c0c39c0f516d9927a38d16241fe9900c487c641	no	32
Warnings:					
Information:					
3		EFACT-011A_response.pdf	443296 d2f06d121cd8757dd8ae7682fba9db6a6c581b26	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant summary of interview with examiner		6	6	
	Applicant Arguments/Remarks Made in an Amendment		7	11	
Warnings:					
Information:					
4		EFACT-011A_ids.pdf	96116 d5562dd9111b64243591ced6a7c2027037e1d0	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Filed (SB/08)		2	2	
Warnings:					
Information:					
5	Fee Worksheet (PTO-875)	fee-info.pdf	32553 72f6db18d7457c0b9c0067176c11941eaf3b	no	2
Warnings:					
0173					

Information:**Total Files Size (in bytes):**

4740373

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTD-675 (Rev. 07/08)

Approved for use through 10/1/2007. OMB 3500-0002
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTD-675					Application or Ombuds Number 12/502,084		Filing Date 07/13/2009		<input type="checkbox"/> To be Mailed	
APPLICATION AS FILED - PART I										
(Column 1)			(Column 2)		SMALL ENTITY <input checked="" type="checkbox"/> OR		OTHER THAN SMALL ENTITY			
PCR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.181(a), (b) or (c))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.181(d), (e) or (f))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.181(g), (h) or (i))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.181(j))	20	0	X \$			X \$				
INDEPENDENT CLAIMS (37 CFR 1.181(j))	2	0	X \$			X \$				
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.181(k))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 411(a)(1)(G) and 37 CFR 1.181(s).									
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.181(l))										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)			(Column 2)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY			
AMENDMENT	02/07/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.181(j))	20	N/A	22	0	X \$	0		X \$		
Independent (37 CFR 1.181(j))	2	N/A	3	0	X \$	0		X \$		
<input type="checkbox"/> Application Size Fee (37 CFR 1.181(k))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.181(l))										
TOTAL ADD'L FEE					0		OR	TOTAL ADD'L FEE		
AMENDMENT										
(Column 1)			(Column 2)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY			
AMENDMENT	02/07/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.181(j))	20	N/A	22	0	X \$	0		X \$		
Independent (37 CFR 1.181(j))	2	N/A	3	0	X \$	0		X \$		
<input type="checkbox"/> Application Size Fee (37 CFR 1.181(k))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.181(l))										
TOTAL ADD'L FEE							OR	TOTAL ADD'L FEE		
<p>* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" is the PHS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number shown in the appropriate box in column 1.</p>										

Legal Instrument Examiner:
DEBRA A. SAVOY

This collection of information is required by 37 CFR 1.14. The information is required to obtain or retain a benefit by the public which is to be paid by the USPTO to protect an invention. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, reviewing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22315-1450. DO NOT SEND PAGES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22315-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	BEFACT011A	5514

20995	7590	12/23/2010
KNOBBE MARTENS OLSON & BEAR LLP		
2040 MAIN STREET		
FOURTEENTH FLOOR		
IRVINE, CA 92614		

EXAMINER	
ROBERTSON, DAVID	

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
12/23/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcarter@kmob.com
 cfiling@kmob.com
 cOAPilot@kmob.com

Interview Summary	Application No.	Applicant(s)
	12/602,064	STEINBERG, JOHN DOUGLAS
	Examiner	Art Unit
	Dave Robertson	2121

All participants (applicant, applicant's representative, PTO personnel):

(1) Dave Robertson (3) John Steinberg (Applicant/Inventor)

(2) Atty John King (Reg. No. 34,862) (4) _____

Date of interview: 17 December 2019

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal (copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____

Claim(s) discussed: 1

Identification of prior art discussed: Williams et al. (5,977,964)

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Dave Robertson Examiner, Art Unit 2121	
--	--

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)**

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Discussed general position of Inventor's company Ecofactor in the energy management software services sector, particularly for residential energy consumption management. Discussed Williams et al. as similar in principle to detecting and identifying a particular user by usage patterns of electronic and other appliances, applying user profile settings to set temperature and other environment parameters as potentially distinct from invention in that Williams does not seek to use non-traditional means for non-occupancy detection, i.e. to determine when a residence is un-occupied based on lack of determined usage pattern. As disclosed in ¶[0039] of the original specification, Applicant calls attention to detection of non-occupancy by determination of usage patterns and confirmation (or non-confirmation) of non-occupancy as have utility in determining whether to apply HVAC settings that are "intended to apply when the home is unoccupied..." by retrieving from a database "the user's specific preferences for how to handle the situation." Examiner suggested the phrases "intended to apply" and "handle the situation" suggest features discussed in interview of the invention using profile and historical data with a user confirmation to better determine whether non-occupancy is the present situation and non-occupancy energy savings management actions are intended be applied, but that may be insufficiently presently described to enable a claim incorporating a step of such determination as no algorithm for the determining of the situation is explicitly provided. Examiner indicated comparison to traditional means of non-occupancy detection (motion detectors, light switches) may read (broadly) on claim 1 as currently presented with no further distinction on "use" within "use of said networked electronic devices..." even if claiming such use as "indicates non-occupancy." No claim amendments were specifically discussed and no agreements reached presently on applicability of Williams et al. alone or in part or as to enablement of any feature or patentability over Williams or other prior art of record or in the art, however, Examiner indicated upon review of response and after further search on amended claims and aspects claimed and better understood as result of interview, further interview before a final response may be productive and that if desired Applicant on response should so indicate.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/502,064	07/13/2009	John Douglas Steinberg	EEFACT.011A

CONFIRMATION NO. 5514

PUBLICATION NOTICE



0000000044349550

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Title: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Publication No. US-2010-0280667-A1

Publication Date: 11/04/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
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 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	BEFACT.011A	5514

20995	7590	10/07/2010
KNOBBE MARTENS OLSON & BEAR LLP		
2040 MAIN STREET		
FOURTEENTH FLOOR		
IRVINE, CA 92614		

EXAMINER	
ROBERTSON, DAVID	

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
10/07/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcarter@kmob.com
 cfiling@kmob.com
 cOAPilot@kmob.com

Office Action Summary

Application No.

12/502,064

Applicant(s)

STEINBERG, JOHN DOUGLAS

Examiner

Dave Robertson

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-18 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/18/09 7/7/10</u> . | 6) <input type="checkbox"/> Other: _____. |

Application/Control Number: 12/502,064
Art Unit: 2121

Page 2

DETAILED ACTION

1. This is a Non-final First Office Action on the Merits. Claims 1-7, 9-18, and 20-22 as amended by Preliminary Amendment received 7/07/2010 are examined herein.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7, 9-18, and 20-22 rejected under 35 U.S.C. 102(b) as being anticipated by Williams et al. (US Pat. No. 5,977,864).

Claim 1

Williams et al. teaches **a method for varying temperature setpoints for an HVAC system comprising:**

determining whether one or more networked electronic devices inside a structure are in use (column 5, lines 31-40: determined from user activating a system device, e.g. television, which is networked; see also Figures 1 and 7 (706));

determining whether said use of said networked electronic devices indicates occupancy of said structure (Figure 7 (706); column 5, lines 31-40; Figure 3; column 9, lines 17-59: noting that “occupancy” of a user is assumed if the user is present);

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 Art Unit: 2121

Page 3

and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied (see column 6, lines 50-67: storing a "wide range of configurable options" in the user profile database, including (column 6, lines 45-65), "general purpose control outputs which may configured to control...thermostat settings", such that thermostat settings may be set according to the "configurable options in accordance with the preferences of the identified user" (column 15, lines 46-63, esp. lines 57-59) when detected by the "detection module" (i.e. when the structure containing the system device, e.g. the television, is "occupied"))).

Claims 2-4 and 6

Williams et al. teaches **the method of Claim 1 in which said networked electronic device is a television** (Figure 8 "TELEVISION"); ... **a personal computer** (Figure 8 "COMPUTER"); ... **connected to the Internet** (Figure 8 "COMPUTER/INTERNET"); ... **a game console** (Figure 8 "COMPUTER-INTERNET-GAMES" (i.e. the computer connected to the Internet functioning as a "game console").

Claim 5

Williams et al. teaches **the method of Claim 1 in which programming being watched or listened to using said networked electronic device is used to determine which occupant of said structure is likely to be present** (column 5, lines 31-40; Figure 3; column 9, lines 17-59), **and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said networked electronic device** (see column 6, lines 45-65), "general

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purpose control outputs which may configured to control...thermostat settings", such that thermostat settings may be set according to the "configurable options in accordance with the preferences of the identified user" (column 15, lines 46-63, esp. lines 57-59) when detected by the "detection module" (i.e. when the structure containing the system device, e.g. the television, is "occupied")).

Claims 7, 9, and 10

Williams et al. teaches **the method of Claim 1, in which said networked electronic device communicates with a remote server** (column 15, lines 16-22); ... **in which said adjusting of said temperature setpoints is initiated by a remote computer** (Figure column line); ... **which [are] varied automatically** (column 12, line 29-35: i.e. each time a new user is (automatically) detected)).

Claim 11

Williams et al. teaches **the method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said temperature setpoint** (column 10, lines 26-41).

Claims 12-22 recite *systems* substantially for performing the methods of claims 1-7 and 9-11, and are similarly rejected for reasons given above, for the respective claim and claim elements, and further that Williams et al. teaches a *system* (Figure 7).

Conclusion

4. The prior art made of record and listed on the attached PTO Form 892 but not relied upon is considered pertinent to applicant's disclosure.

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Page 5

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on 9 am to 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dave Robertson/
Examiner, Art Unit 2121

Notice of References Cited	Application/Control No. 12/502,064		Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS	
	Examiner Dave Robertson		Art Unit 2121	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,682,949 A	11-1997	Ratcliffe et al.	165/209
*	B	US-5,977,964 A	11-1999	Williams et al.	715/721
*	C	US-6,912,429 B1	06-2005	Bilger, Brent	700/19
*	D	US-2006/0045105 A1	03-2006	Dobosz et al.	370/401
*	E	US-7,061,393 B2	06-2006	Buckingham et al.	340/693.3
*	F	US- H,002,176 H	12-2006	Meyer et al.	236/51
*	G	US-2007/0146126 A1	06-2007	Wang, Ling	340/517
*	H	US-7,242,988 B1	07-2007	Hoffberg et al.	700/28
*	I	US-7,260,823 B2	08-2007	Schlack et al.	725/9
*	J	US-2008/0281472 A1	11-2008	Podgorny et al.	700/276
*	K	US-7,483,964 B1	01-2009	Jackson et al.	709/221
*	L	US-2009/0052859 A1	02-2009	Greenberger et al.	386/46
*	M	US-2010/0162285 A1	06-2010	Cohen et al.	725/12

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/502,064		Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS	
	Examiner Dave Robertson		Art Unit 2121	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2010/0156608 A1	06-2010	BAE et al.	340/10.5
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 1 OF 1		Attorney Docket No. EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	2009/0099699 A1	04-16-2009	Steinberg et al.	
	2	2009/0125151 A1	05-14-2009	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	3	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome	

9298210
070210

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DCR/

Examiner Signature	/Dave Robertson/ (09/28/2010)	Date Considered	09/28/2010
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			

T¹ - Place a check mark in this area when an English language translation is attached.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 1 OF 4		Attorney Docket No. JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,403,644	09-13-1983	Hebert, Raymond T.	
	2	4,674,027	06-16-1987	Thomas J. Beckey	
	3	5,572,438	11-05-1996	Ehlers, et al.	
	4	5,717,609	02-10-1998	Packa, et al.	
	5	6,145,751	11-14-2000	Ahmed	
	6	6,178,362	01-23-2001	Woolard, et al.	
	7	6,351,693	02-26-2002	Monie	
	8	6,400,996	06-04-2002	Hoffberg, et al.	
	9	6,437,692	08-20-2002	Petite, et al.	
	10	6,478,233	11-12-2002	Shah	
	11	6,480,803	11-12-2002	Pierret, et al.	
	12	6,483,906	11-19-2002	Lggulden, et al.	
	13	6,536,675	03-25-2003	Pesko, et al.	
	14	6,542,076	04-01-2003	Joao	
	15	6,549,130	04-15-2003	Joao	
	16	6,574,537	06-02-2003	Kipersztok, et al.	
	17	6,580,950	06-17-2003	Johnson	
	18	6,594,825	07-15-2003	Goldschmidtiki, et al.	
	19	6,595,430	07-22-2003	Shah	
	20	6,598,056	07-22-2003	Hull, et al.	
	21	6,619,555	09-16-2003	Howard B. Rosen	
	22	6,622,097	09-16-2003	Robert R. Hunter	
	23	6,622,115	09-16-2003	Brown, et al.	
	24	6,622,925	09-23-2003	Carner, et al.	
	25	6,622,926	09-23-2003	Sartain, et al.	
	26	6,628,997	09-30-2003	Fox, et al.	
	27	6,633,823	10-14-2003	Bartone, et al.	
	28	6,643,567	11-04-2003	Kolk et al.	
	29	6,671,586	12-30-2003	Davis, et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.
 ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DCR/

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 2 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,695,218	02-24-2004	Fleckenstein	
	31	6,726,113	04-27-2004	Guo	
	32	6,731,992	05-04-2004	Ziegler	
	33	6,734,806	05-11-2004	Cratsley	
	34	6,772,052	08-03-2004	Amundsen	
	35	6,785,592	08-31-2004	Smith	
	36	6,785,630	08-31-2004	Kolk	
	37	6,789,739	09-14-2004	Howard Rosen	
	38	6,853,959	02-08-2005	Ikeda, et al.	
	39	6,868,293	03-15-2005	Schurr	
	40	6,868,319	03-15-2005	Kipersztok, et al.	
	41	6,882,712	04-19-2005	Iggulden, et al.	
	42	6,889,908	05-10-2005	Crippen, et al.	
	43	6,891,838	10-10-2005	Petite, et al.	
	44	6,991,029	01-31-2006	Orfield, et al.	
	45	7,009,493	03-07-2006	Howard	
	46	7,031,880	04-18-2006	Seem, et al.	
	47	7,039,532	05-02-2006	Hunter	
	48	7,089,088	08-08-2006	Terry, et al.	
	49	7,130,719	10-31-2006	Ehlers, et al.	
	50	7,130,832	10-31-2006	Bannai, et al.	
	51	7,167,079	01-23-2007	Smyth, et al.	
	52	7,187,986	03-06-2007	Johnson, et al.	
	53	7,205,892	04-17-2007	Luebke, et al.	
	54	7,215,746	05-08-2007	Iggulden, et al.	
	55	7,216,015	05-08-2007	Poth, Robert J.	
	56	7,231,424	06-11-2007	Bodin, et al.	
	57	7,232,075	06-19-2007	Rosen	
	58	2003/0040934 A1	02-27-2003	Skidmore, et al.	

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 3 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	59	2005/0222889 A1	10-06-2005	Lai, et al.	
	60	2005/0288822 A1	12-29-2005	Rayburn, Ronald	
	61	2007/0043477 A1	02-22-2007	Elhers, et al.	
	62	2008/0083234 A1	04-10-2008	Krebs et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	63	ARNES, FEDERSPEIL, WANG, HUIZENG,., How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings, 2005, research paper., Center for the Built Environment. Controls and Information Technology	
	64	Comverge SuperStat Flyer	
	65	Control4 Wireless Thermostat Brochure	
	66	Cooper Power Systems Web Page	
	67	Enernoc Web Page	
	68	Enerwise Website	
	69	JOHNSON CONTORLS, Touch4 building automation system brochure, 2007	
	70	KILICOTTE, PIETTE, WATSON, , Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York, Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA., August 13-18, 2006	
	71	LIN, AUSLANDER and FEDERSPEIL, "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002	
	72	PIER, Southern California Edison., Deman Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report	
	73	Proliphix Thermostat Brochure	

Examiner Signature	Date Considered
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
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(Multiple sheets used when necessary)	Examiner	
SHEET 4 OF 4	Attorney Docket No.	JSTEIN.011A

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	74	WANG, ARENS, FEDERSPIEL., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor networks in Buildings," (2003), Center for Environmental Design Research	
	75	WETTER, WRIGHT, A comparison of deterministic and probabilistic optimization algorithms for nonsmooth simulation-based optimization., Building and Environment 39, 2004, Pages 989-999	

8280885
 121809

Examiner Signature	/Dave Robertson/ (09/28/2010)	Date Considered	09/28/2010
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Alexandria, Virginia 22304-4400
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BIB DATA SHEET

CONFIRMATION NO. 5514

SERIAL NUMBER 12/502,064	FILING or 371(c) DATE 07/13/2009 RULE	CLASS 700	GROUP ART UNIT 2121	ATTORNEY DOCKET NO. EFACT 011A	
APPLICANTS John Douglas Steinberg, Millbrae, CA; ** CONTINUING DATA ***** This appln claims benefit of 61/134,714 07/14/2008 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 07/22/2009					
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a)-(d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not after Allowance Verbalized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Acknowledged <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		STATE OR COUNTRY CA	SHEETS DRAWINGS 8	TOTAL CLAIMS 22	INDEPENDENT CLAIMS 2
ADDRESS KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614 UNITED STATES					
TITLE SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM					
FILING FEE RECEIVED 879	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	55	(US-20090125151-\$ or US-20090090599-\$ or US-20100123560-\$ or US-20100019051-\$ or US-20090284344-\$ or US-20090140838-\$ or US-20080281472-\$ or US-20070146126-\$ or US-20070040672-\$ or US-20070008149-\$ or US-20060267780-\$ or US-20040155781-\$ or US-20100156608-\$ or US-20100138007-\$ or US-20090055403-\$ or US-20060283938-\$ or US-20040178889-\$ or US-20040231003-\$), did. or (US-6912429-\$ or US-6851621-\$ or US- 5682949-\$ or US- 6145751-\$ or US- H002176-\$ or US- 6548130-\$ or US- 6542075-\$ or US- 6361693-\$ or US- 6549816-\$ or US- 6671586-\$ or US- 6643567-\$ or US- 6633623-\$ or US- 6628997-\$ or US- 6622926-\$ or US- 6622925-\$ or US- 6622097-\$ or US- 6619555-\$ or US- 6598055-\$ or US- 6605430-\$ or US- 6594825-\$ or US- 6574537-\$ or US- 6536675-\$ or US- 6480803-\$ or US- 6437692-\$ or US- 6400996-\$ or US- 6178362-\$), did. or (US- 5717609-\$ or US- 5572438-\$ or US- 4674027-\$ or US-	US-PCPUB; USPAT; DERWENT	ADJ	ON	2010/09/29 09:34

		4403644-\$ or US- 7354005-\$ or US- 7392042-\$ or US- 7248170-\$ or US- 7027617-\$ or US- 6633223-\$ or US- 7061393-\$) did. or (WO 2009069998 \$). did.				
L8	0	(11/183602) APP.	USPAT; USOCR	ADJ	ON	2010/09/29 09:57
L11	1138	((television or TV/ or video) with (channel or media or program\$4 or content)) same ((unoccup\$3 or occupied or occupancy or presence)) same (((whol or person or user or individual or viewer or occupant or identity) with (identi\$6 or recogni\$7 or determin\$ or detect \$)))	US-PGPUB; USPAT; DERWENT	ADJ	ON	2010/09/29 10:00
L13	631	((television or TV/ or video) with (channel or media or program\$4 or content)) same ((unoccup\$3 or occupied or occupancy or presence) with (detect\$ or determin\$ or recogniz\$)) same (((whol or person or user or individual or viewer or occupant or identity) with (identi\$6 or recogni\$7 or determin\$ or detect \$)))	US-PGPUB; USPAT; DERWENT	ADJ	ON	2010/09/29 10:04
L14	96	(temperature or thermostat or environment\$2 or HVAC/ or heating or cooling) with (control \$4 or setting or set \$1point) and 113	US-PGPUB; USPAT; DERWENT	ADJ	ON	2010/09/29 10:09
L15	2	"5977964".pt.	US-PGPUB; USPAT; DERWENT	ADJ	ON	2010/09/29 10:41

L17	2	(((television or TV! or video) (channel or media or program\$4 or content)) ((unoccup\$3 or occupied or occupancy or presence) (detect\$ or determin\$ or recogniz\$)) ((who! or person or user or individual or viewer or occupant or identity) (ident:\$6 or recogni\$7 or determin\$ or detect\$)))) and I15	US-POPUB; USPAT; DERWENT	OR	ON	2010:09/29 10:46
L18	1	(temperature or thermostat or environment\$2 or HVAC! or heating or cooling) with (control \$4 or setting or set \$1point) and I17	US-POPUB; USPAT; DERWENT	ADJ	ON	2010:09/29 10:48
L19	214	("5977964") URPV	USPAT	ADJ	ON	2010:09/29 10:50
L20	214	(((television or TV! or video) (channel or media or program\$4 or content)) ((unoccup\$3 or occupied or occupancy or presence) (detect\$ or determin\$ or recogniz\$)) ((who! or person or user or individual or viewer or occupant or identity) (ident:\$6 or recogni\$7 or determin\$ or detect\$)))) and I19	US-POPUB; USPAT; DERWENT	OR	ON	2010:09/29 10:50
L22	13	(temperature or thermostat or environment\$2 or HVAC! or heating or cooling) with (control \$4 or setting or set \$1point) and I20	US-POPUB; USPAT; DERWENT	ADJ	ON	2010:09/29 10:51
L23	9	(temperature or thermostat or HVAC! or heating or cooling) with (control\$4 or setting or set\$1point) and I20	US-POPUB; USPAT; DERWENT	ADJ	ON	2010:09/29 10:55

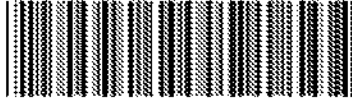
S4	0	("12502064".rlan. or ("12".src. and "502064".ap.)	US-POPUS; USPAT; USOCR; DERWENT	ADJ	ON	2010/09/23 21:08
S5	0	("61134714".rlan. or ("61".src. and "134714".ap.)	US-POPUS; USPAT; USOCR; DERWENT	ADJ	ON	2010/09/23 21:08
S6	53	((JOHN) near2 (STEINBERG)).INV.	US-POPUS; USPAT	ADJ	ON	2010/09/23 21:08
S7	57	("20090099699" "20090125151" "4403644" "4674027" "5572438" "6717609" "6145751" "6178362" "6351693" "6400996" "6437692" "6480803" "6536675" "6542076" "6549130" "6574537" "6594825" "6595430" "6598056" "6619555" "6622097" "6622925" "6628997" "6633823" "6643567" "6671588").PNL	US-POPUS; USPAT; USOCR; DERWENT	ADJ	ON	2010/09/28 20:45
S8	387	700/276.cox.	US-POPUS; USPAT; DERWENT	ADJ	ON	2010/09/28 21:03
S9	30	("235"/\$ "700"/\$ "340"/ \$).ccis.	US-POPUS; USPAT; DERWENT	AND	ON	2010/09/28 21:05
S10	208254	("235"/\$ "700"/\$ "340"/ \$).ccis.	US-POPUS; USPAT; DERWENT	OR	ON	2010/09/28 21:05
S11	12	(unoccup\$3 or occup \$3 or occupancy) and \$9	US-POPUS; USPAT; DERWENT	OR	ON	2010/09/28 21:06
S13	131640	(unoccup\$3 or occup \$3 or occupancy or presence) with (who! or person or user! or Identif\$2)	US-POPUS; USPAT; DERWENT	OR	ON	2010/09/28 21:09
S15	4	S13 and S11	US-POPUS; USPAT; DERWENT	OR	ON	2010/09/28 21:09

S16	6	S13 and S9	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:09
S17	6	S13 and S7	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:09
S18	11	S15 or S16 or S17	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:09
S19	8161	(unoccup\$3 or occup \$3 or occupancy or presence) same ((who! or person or user! or identity) with (identity or recognize))	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:11
S20	716	S19 and S10	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:11
S21	1	S19 and S8	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:11
S22	1	S19 and S7	US POPUB; USPAT; DERWENT	OR	ON	2010/09/28 21:12
S23	12	("6145751").URPN.	USPAT	ADJ	ON	2010/09/28 21:13
S24	0	("H002176").URPN.	USPAT	ADJ	ON	2010/09/28 21:15
S25	27	("20090099699" "20090125151" "4403844" "4874027" "5572438" "5717609" "6145751" "6178362" "6351693" "6400996" "6437692" "6480803" "6536675" "6542076" "6540130" "6574537" "6594825" "6595430" "6598056" "6619555" "6622097" "6622925" "6622925" "6628997" "6633823" "6643567" "6671586").PN.	US POPUB; USPAT; USOCR	ADJ	ON	2010/09/28 21:18

S26	953	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity) with (identity or recognize))) ti,ab,cm.	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:22
S27	95	S10 and S26	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:22
S30	4721	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity or individual) with (identif\$5 or recogni\$7))) ti,ab,cm.	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:33
S31	334	S30 and S10	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:34
S32	2362	((unoccup\$3 or occup\$3 or occupancy or presence) same ((who! or person or user! or identity or individual) near3 (identif\$5 or recogni\$7))) ti,ab,cm.	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:34
S33	174	S32 and S10	US POPUS; USPAT; DERWENT	OR	ON	2010:09/28 21:34
S37	1	((television near5 (in\$1-use or usage or turned adj on)) and S30	US POPUS; USPAT; DERWENT	AND	ON	2010:09/28 21:43
S38	8	((video or television or TV! or DVD!) near5 (in\$1-use or usage or turned adj on)) and S30	US POPUS; USPAT; DERWENT	AND	ON	2010:09/28 21:43
S39	1	(10/672712).APP.	USPAT; USOCR	ADJ	ON	2010:09/28 21:45

9/29/2010 11:03:56 AM

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Steinberg energy use monitor tv viewing habits.wsp

Index of Claims 	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected


☐ Claims renumbered in the same order as presented by applicant

☐ CPA

☐ T.O.

☐ R.1.47

CLAIM		DATE									
Final	Original	09/24/2010									
	1	✓									
	2	✓									
	3	✓									
	4	✓									
	5	-									
	6	✓									
	7	✓									
	8	-									
	9	✓									
	10	✓									
	11	-									
	12	✓									
	13	✓									
	14	✓									
	16	✓									
	16	✓									
	17	✓									
	18	✓									
	19	-									
	20	✓									
	21	✓									
	22	-									

Search Notes 	Application/Control No. 12502064	Applicant(s)/Patent Under Reexamination STEINBERG, JOHN DOUGLAS
	Examiner Dave Robertson	Art Unit 2121

SEARCHED			
Class	Subclass	Date	Examiner
700	276	9/28/2010	dcr

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (USPAT, PgPUB, Derwent - see complete search history in application file)	9/29/2010	dcr
"236"/\$ "700"/\$ "340"/\$ (text-limited and cross-classification search - see search history)	9/28/2010	dcr

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

/Dave Robertson/
Examiner, Art Unit 2121



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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/502,064	07/13/2009	John Douglas Steinberg	EEACT.011A

CONFIRMATION NO. 5514

NONPUBLICATION RESCISSION
LETTER

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 07/26/2010

Communication Regarding Rescission Of Nonpublication Request and/or Notice of Foreign Filing

Applicant's rescission of the previously-filed nonpublication request and/or notice of foreign filing is acknowledged. The paper has been reflected in the Patent and Trademark Office's (USPTO's) computer records so that the earliest possible projected publication date can be assigned.

The projected publication date is 11/04/2010.

If applicant rescinded the nonpublication request before or on the date of "foreign filing,"¹ then no notice of foreign filing is required.

If applicant foreign filed the application after filing the above application and before filing the rescission, and the rescission did not also include a notice of foreign filing, then a notice of foreign filing (not merely a rescission) is required to be filed within 45 days of the date of foreign filing. See 35 U.S.C. § 122(b)(2)(B)(iii), and Clarification of the United States Patent and Trademark Office's Interpretation of the Provisions of 35 U.S.C. § 122(b)(2)(B)(ii)-(iv), 1272 Off. Gaz. Pat. Office 22 (July 1, 2003).

If a notice of foreign filing is required and is not filed within 45 days of the date of foreign filing, then the application becomes abandoned pursuant to 35 U.S.C. § 122(b)(2)(B)(iii). In this situation, applicant should either file a petition to revive or notify the Office that the application is abandoned. See 37 CFR 1.137(f). Any such petition to revive will be forwarded to the Office of Petitions for a decision. Note that the filing of the petition will not operate to stay any period of reply that may be running against the application.

Questions regarding petitions to revive should be directed to the Office of Petitions at (571) 272-3282.

¹ Note, for purpose of this notice, that "foreign filing" means "filing an application directed to the same invention in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing".

/tjkoontz/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/502,064	07/13/2009	John Douglas Steinberg	EEFACT.011A

CONFIRMATION NO. 5514

EARLY PUBLICATION REQUEST
 LETTER



0000000042729767

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 IRVINE, CA 92614

Date Mailed: 07/26/2010

NOTICE REGARDING EARLY PUBLICATION REQUEST

The request for voluntary publication, amended publication, early publication, redacted publication, republication, corrected publication or revised publication has been received for this application. The request, including payment of any necessary fee(s), is in compliance with 37 CFR 1.215, 1.217, 1.219 or 1.221.

The projected publication date is 11/04/2010.

/tjkoontz/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/502,064	07/13/2009	John Douglas Steinberg	EFACT.011A	5514
20995 7590 07/19/2010 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER DECADY, ALBERT	
			ART UNIT 2121	PAPER NUMBER
			NOTIFICATION DATE 07/19/2010	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
efiling@kmob.com
eOAPilot@kmob.com



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KNOBBE MARTENS OLSON & BEAR LLP
 2040 Main Street
 Fourteenth Floor
 Irvine CA 92614

In re Application of	:	
STEINBERG, John	:	DECISION ON PETITION
Application No. 12/502,064	:	TO MAKE SPECIAL UNDER
Filed: July 13, 2009	:	THE GREEN TECHNOLOGY
Attorney Docket No. EFACT.011A	:	PILOT PROGRAM

This is a decision on the renewed petition under 37 CFR 1.102, filed July 7, 2010, to make the above-identified application special under the pilot program for applications pertaining to Green Technologies as set forth in 74 Federal Register Notice 64666 (December 8, 2009) and amended by 75 Federal Register Notice 28554 (May 21, 2010).

The petition is **GRANTED**.

A grantable petition to make an application special under 37 CFR 1.102 and the pilot program as set forth in 74 FR 64666 must be directed to a nonprovisional application filed under 35 USC 111(a) or be a national stage entry under 35 USC 371, exclusive of any reissue applications and be filed prior to the date of the notice, December 8, 2009.

In order to qualify for special status, the following requirements must be met. 1) The application must have no more than 3 independent claims and no more than 20 total claims. 2) The application must not contain any multiple dependent claims. 3) The petition must state the basis for seeking special status, i.e., the claimed invention either: A) materially enhances the quality of the environment or B) materially contributes to: i) the discovery or development of renewable energy resources, ii) the more efficient utilization and conservation of energy resources, or iii) greenhouse gas emission reduction. 4) If the disclosure is not clear on its face that the claimed invention materially contributes under category (A) or (B), the petition must be accompanied by a statement by the applicant, assignee, or an attorney/agent registered to practice before the Office explaining how the materiality standard is met. 5) A statement that applicant will agree to make an election without traverse in a telephonic interview if a restriction requirement is made by the examiner. 6) The petition to make special must be filed electronically. 7) The petition must be filed at least one day prior to the date that a first Office Action appears in the Patent

Application Information Retrieval (PAIR) system. 8) The petition must be accompanied by a request for early publication in compliance with 37 CFR 1.219 and include the publication fee as set forth in 37 CFR 1.18(d).

The requirement for a fee for consideration of the petition to make special for applications pertaining to Green Technologies has been waived.

The instant petition complies with items 1 – 8 above. Accordingly, the above-identified application has been accorded “special” status.

The application is being forwarded to the Technology Center Art Unit 2121 for action on the merits commensurate with this decision.

Telephone inquiries concerning this decision should be directed to Eddie C. Lee at 571-272-1732.

/Eddie C. Lee/

Eddie C. Lee
Quality Assurance Specialist
Technology Center 2100

EFACT.011A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	John Douglas Steinberg
App. No	:	12/502,064
Filed	:	July 13, 2009
For	:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Art Unit	:	3744
Conf. No.	:	5514

PRELIMINARY AMENDMENT

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Prior to the examination of the above-captioned application, please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Application No.: 12/502,064

Filing Date: July 13, 2009

AMENDMENTS TO THE CLAIMS

Please cancel Claims 8 and 19 without prejudice or disclaimer.

1. (Original) A method for varying temperature setpoints for an HVAC system comprising:

determining whether one or more networked electronic devices inside a structure are in use;

determining whether said use of said networked electronic devices indicates occupancy of said structure; and

adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

2. (Original) The method of Claim 1 in which said networked electronic device is a television.

3. (Original) The method of Claim 1 in which said networked electronic device is a personal computer.

4. (Original) The method of Claim 1 in which said networked electronic device is connected to the Internet.

5. (Original) The method of Claim 1 in which programming being watched or listened to using said networked electronic device is used to determine which occupant of said structure is likely to be present, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said networked electronic device.

6. (Original) The method of Claim 1 in which said networked electronic device is a game console.

7. (Original) The method of Claim 1 in which said networked electronic device communicates with a remote server.

Application No.: 12/502,064

Filing Date: July 13, 2009

8. (Canceled)
9. (Original) The method of Claim 1 in which said adjusting of said temperature setpoints is initiated by a remote computer.
10. (Original) The method of Claim 1 in which said temperature setpoints are varied automatically.
11. (Original) The method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said temperature setpoint.
12. (Original) A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:
 - at least one thermostat having at least one temperature setting associated with the presence of one or more occupants in a structure, and at least one temperature setting associated with the absence of occupants in said structure;
 - one or more electronic devices having at least a user interface;
 - wherein said electronic devices and said thermostat are connected to a network; and
 - wherein said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.
13. (Original) The system of Claim 12 in which said electronic device is a television.
14. (Original) The system of Claim 12 in which said electronic device is a personal computer.
15. (Original) The system of Claim 12 in which said electronic device is connected to the Internet.

Application No.: 12/502,064

Filing Date: July 13, 2009

16. (Original) The system of Claim 12 in which the programming being watched or listened to using said networked electronic device is used to determine which occupant of said structure is likely to be using said networked electronic device, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said networked electronic device.

17. (Original) The system of Claim 12 in which said networked electronic device is a game console.

18. (Original) The system of Claim 12 in which said networked electronic device communicates with a remote server.

19. (Canceled)

20. (Original) The system of Claim 12 in which variation of temperature setpoints is initiated by a remote computer.

21. (Original) The system of Claim 12 in which said temperature setpoints are varied automatically.

22. (Original) The system of Claim 12 in which an occupant is prompted to confirm occupancy prior to adjustment of said temperature setpoint.

Application No.: 12/502,064
Filing Date: July 13, 2009

REMARKS

Claims 1-22 were previously pending. In this preliminary amendment, Applicant has canceled Claims 8 and 19. Accordingly, a total of 20 Claims, Claims 1-7, 9-18, and 20-22 are currently pending.

The Applicant believes that this Preliminary Amendment places the application in conformance with the requirements for the Green Technology Pilot Program listed in PTO/SB/420, filed herewith, and 74 Fed. Reg. 64,666 (Dec. 8, 2009), as amended by 75 Fed. Reg. 28,544 (May 21, 2010).

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing three new references. Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make the references of record.

OTHER APPLICATIONS OF ASSIGNEE

Applicant wishes to draw the Examiner's attention to the following applications owned by of the present application's assignee:

Inventors	Appl. No.	Filing Date	Attorney Docket No.	Title
Steinberg et al.	60/963,183 Now Expired	08/03/07	EFACT.003PR	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	60/944,011 Now Expired	09/17/07	EFACT.005PR	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/183,990	07/31/08	EFACT.003A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction
Steinberg et al.	12/183,949	07/31/08	EFACT.004A	System And Method For Using A Network Of Thermostats As Tool To Verify Peak Demand Reduction

Application No.: 12/502,064

Filing Date: July 13, 2009

Steinberg et al.	12/211,733	09/16/08	EFACT.005A	System And Method For Calculating The Thermal Mass Of A Building
Steinberg et al.	12/211,690	09/16/08	EFACT.006A	System And Method For Evaluating Changes In The Efficiency Of An Hvac System
Steinberg	61/215,816 Now Expired	05/11/09	EFACT.008PR	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	61/215,657 Now Expired	05/04/10	EFACT.009PR	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg et al.	61/215,999 Now Expired	05/12/09	EFACT.007PR	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Cheung et al.	12/498,142	07/06/09	EFACT.010A	System And Method For Using Ramped Setpoint Temperature Variation With Networked Thermostats To Improve Efficiency
Steinberg et al.	12/773,690	05/04/10	EFACT.009A	System, Method And Apparatus For Just-In-Time Conditioning Using A Thermostat
Steinberg	12/774,580	05/05/10	EFACT.008A	System, Method And Apparatus For Dynamically Variable Compressor Delay In Thermostat To Reduce Energy Consumption
Steinberg et al.	12/778,052	05/11/10	EFACT.007A	System, Method And Apparatus For Identifying Manual Inputs To And Adaptive Programming Of A Thermostat
Steinberg	12/788,246	05/26/10	EFACT.012A	System And Method For Using A Mobile Electronic Device To Optimize An Energy Management System

Applicant notes that cited references, office actions, responses and notices of allowance currently exist or will exist for the above-referenced matters. Applicant also understands that the Examiner has access to sophisticated online Patent Office computing systems that provide ready access to the full file histories of these matters

Application No.: 12/502,064

Filing Date: July 13, 2009

including, for example, specifications, drawings, pending claims, cited art, office actions, responses, declarations, and notices of allowance.

Rather than submit these file histories, Applicant respectfully requests that the Examiner continue to review these file histories online for past, current, and future information about these matters. Also, if the Examiner cannot readily access these file histories, the Applicant would be pleased to provide any portion of any of the file histories at any time upon specific Examiner request.

NO DISCLAIMERS OR DISAVOWALS

The Applicant reserves the right to pursue claims directed to all or part of the subject matter described in the instant application, including the subject matter of any claims amended, withdrawn, or canceled at any time during the prosecution of this application, and thus, unclaimed subject matter is not dedicated to the public.

Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution.

Accordingly, reviewers of this or any parent, child, or related prosecution history shall not infer that the Applicant has made any disclaimers or disavowals of any subject matter supported by the present Application.

CONCLUSION

The Examiner is cordially invited to contact the undersigned such that any remaining issues may be promptly resolved.

Application No.: 12/502,064

Filing Date: July 13, 2009

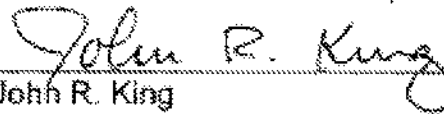
Also, please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 7-7-2010

By:



John R. King

Registration No. 34,362

Attorney of Record

Customer No. 20,995

(949) 760-0404

529/803 ad
075210

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

RESCISSION OF PREVIOUS NONPUBLICATION REQUEST

(35 U.S.C. 122(b)(2)(B)(ii))

AND, IF APPLICABLE,

NOTICE OF FOREIGN FILING

(35 U.S.C. 122(b)(2)(B)(iii))

Send completed form to:

Mail Stop PG Pub

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

FAX: (571) 273-8300

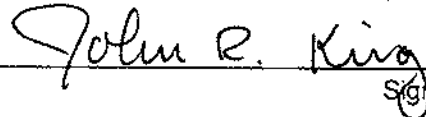
Application Number	12/502,064
Filing Date	July 13, 2009
First Named Inventor	John Douglas Steinberg
Title	SYSTEM AND METHOD FOR USING A NET
Atty Docket Number	EFACT.011A
Art Unit	3744
Examiner	Unknown

A request that the above-identified application not be published under 35 U.S.C. 122(b) (nonpublication request) was included with the above-identified application on filing pursuant to 35 U.S.C. 122(b)(2)(B)(i).

I hereby **rescind** the previous nonpublication request.

If a notice of foreign or international filing is or will be required by 35 U.S.C. 122(b)(2)(B)(iii) and 37 CFR 1.213(c), I hereby provide such notice. This notice is being provided no later than forty-five (45) days after the date of such foreign or international filing.

If a notice of subsequent foreign or international filing required by 35 U.S.C. 122(b)(2)(B)(iii) and 37 CFR 1.213(c) was not filed within forty-five (45) days after the date of filing of the foreign or international application, the application is **ABANDONED**, and a petition to revive under 37 CFR 1.137(b) is required. See 37 CFR 1.137(f).



Signature

7-7-2010

Date

John R. King

34,362

Typed or printed name

Registration Number, if applicable

949-760-0404

Telephone Number

This request must be signed in compliance with 37 CFR 1.33(b).

If information or assistance is needed in completing this form, please contact the Pre-Grant Publication Division at (703)605-4283 or by e-mail at PGPub@USPTO.gov.

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop PG Pub, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature

Name (Print/Type)

Date

This collection of information is required by 37 CFR 1.213(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop PG Pub, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Docket No.: EFACT.011A

Customer No. 20995

INFORMATION DISCLOSURE STATEMENT

Applicant : John Douglas Steinberg
App. No : 12/502,064
Filed : July 13, 2009
For : SYSTEM AND METHOD FOR USING A
NETWORKED ELECTRONIC DEVICE AS AN
OCCUPANCY SENSOR FOR AN ENERGY
MANAGEMENT SYSTEM
Examiner : Unknown
Art Unit : 3744
Conf No. : 5514

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing three (3) references, of which one (1) is enclosed/submitted.

This Information Disclosure Statement is being filed before the receipt of a first Office Action on the merits, and presumably no fee is required. If a first Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 C.F.R. § 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 7-7-2010

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20995
(949) 760-0404

ES10482.96
070710

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 1 OF 1		Examiner
		Attorney Docket No. EFACT.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	2009/0099699 A1	04-16-2009	Steinberg et al.	
	2	2009/0125151 A1	05-14-2009	Steinberg et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	3	Honeywell Programmable Thermostat Owner's Guide, www.honeywell.com/yourhome	

9298210
070210

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	JSTEIN.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Publ. Fee- early, voluntary, or normal	1504	1	300	300
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:	0219			

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				300

Electronic Acknowledgement Receipt

EFS ID:	7969205
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Chelsea Pearsall
Filer Authorized By:	John R. King
Attorney Docket Number:	JSTEIN.011A
Receipt Date:	07-JUL-2010
Filing Date:	13-JUL-2009
Time Stamp:	17:45:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 300
RAM confirmation Number	4026
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0207 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition for Green Tech Pilot	EFACT-011A_petition.pdf	79379 f2ad192d6806a141d860dd8fcd47c61c72811c8	no	1
Warnings:					
Information:					
2	Petition for Green Tech Pilot	EFACT-011A_statement.pdf	102421 910f1b711951122c06e381d5a1c0c06f5dcb5	no	3
Warnings:					
Information:					
3		EFACT-011A_prelimamend.pdf	277821 1c7f6d121b5d2645d864e09d89c5b8e797d005	yes	8
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Preliminary Amendment		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	8	
Warnings:					
Information:					
4	Rescind Nonpublication Request for Pre Grant Pub	EFACT-011A_rescission.pdf	75531 d7a306eb459ab7848983847d0d9739c70986a	no	1
Warnings:					
Information:					
5		EFACT-011A_ids.pdf	78492 e0581ed7095d1681ee0b11a974a228119a92f11a	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Filed (SB/08)		2	2	
Warnings:					
Information:					

6	NPL Documents	EFACT-011A_ref1.pdf	2407105 b44d5c6a6e8206d1591d144e5d0588e c1708	no	64
Warnings:					
Information:					
7	Fee Worksheet (PTO-875)	fee-info.pdf	30290 c09ed77127108c15ba291d6a06ca122604 1619	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			3051039		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Docket No.: EFACT.011A

Customer No. 20995

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Douglas Steinberg
App. No	: 12/502,064
Filed	: July 13, 2009
For	: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Art Unit	: 3744
Conf. No.	: 5514

**STATEMENT OF SPECIAL STATUS FOR THE ELIGIBILITY REQUIREMENT
UNDER THE GREEN TECHNOLOGY PILOT PROGRAM**

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Statement of Special Status of the Eligibility Requirement is filed pursuant to the requirements listed in PTO/SB/420, filed herewith, and pursuant to the requirements of 74 Fed. Reg. 64,666 (Dec. 8, 2009), as amended by 75 Fed. Reg. 28,554 (May 21, 2010).

Material Contribution To Energy Conservation

A basis for the special status is that the invention ***materially contributes to energy conservation***, namely the use of thermostatic heating, ventilation and air conditioning ("HVAC") systems and other energy management controls that are connected to a computer network.

More specifically, a basis for the special status includes determining whether a structure is occupied by monitoring user interactions with a personal computer or an

Application No.: 12/502,064

Filing Date: July 13, 2009

Internet-enabled television located in the structure. This information is used by an energy management system to reduce energy consumption when the lack of user interactions indicates that the structure is not occupied.

Furthermore, Applicant submits that it is clear on the above-referenced application's face that the claimed invention materially contributes to energy conservation.

Appropriate Number Of Claims

The application is a non-reissue, non-provisional utility application filed under 35 U.S.C. § 111(a) and the application was previously filed before December 8, 2009. In addition, the application, with the submission of the enclosed Preliminary Amendment contains no more than three (3) independent claims and twenty (20) total claims. The application also does not contain any multiple dependent claims.

Furthermore, a first Office Action (including an Office Action containing only a restriction requirement) has not yet appeared in the Patent Application Retrieval (PAIR) system.

Statement Regarding Potential Restriction Requirement

If the U.S. Patent and Trademark Office ("USPTO") determines that the claims are directed to multiple inventions, (e.g., a restriction requirement), Applicant will agree to make an election without traverse in a telephonic interview and will elect an invention that meets the eligibility requirements in section II or III of the notice of the "Elimination of Classification Requirement in the Green Technology Pilot Program."

Early Publication

In addition, Applicant has submitted herewith a Rescission of Request for Non-publication and is hereby requesting early publication under 37 CFR § 1.219. Accordingly, Application has included the fee set forth in 37 CFR § 1.18(d).

Application No.: 12/502,064

Filing Date: July 13, 2009

Conclusion

Applicant respectfully requests that a favorable decision on this Petition to Make Special Under the Green Technology Pilot Program be granted and the application be accorded special status under the Green Technology Pilot Program.

In addition, the Commissioner is hereby authorized to charge any fees which may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: _____

7-7-2010

By: _____

John R. King

John R. King, 34,382

Attorney of Record

Customer No. 20995

(949) 721-7602

9357602
073210

Doc Code: PET.GREEN

Document Description: Petition for Green Tech Pilot

PTO/SB/420 (05-10)

Approved for use through 05/31/2010. OMB 0651-0062
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION TO MAKE SPECIAL UNDER THE GREEN TECHNOLOGY PILOT PROGRAM

Attorney Docket Number: EFACT.011A	Application Number (if known): 12/502,064	Filing date: 07/13/2009
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First Named Inventor: **John Douglas Steinberg**Title: **SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM****APPLICANT HEREBY REQUESTS TO PARTICIPATE IN THE GREEN TECHNOLOGY PILOT PROGRAM FOR THE ABOVE-IDENTIFIED APPLICATION. See Instruction Sheet on page 2.**

This petition must be timely filed electronically using the USPTO electronic filing system, EFS-Web.

1. By filing this petition:

Applicant is requesting early publication: Applicant hereby requests early publication under 37 CFR 1.219 and the publication fee set forth in 37 CFR 1.18(d) accompanies this request.

2. By filing this petition: applicant is agreeing to make an election without traverse in a telephonic interview and elect an invention that meets the eligibility requirements set forth in the notice titled "Pilot Program for Green Technologies Including Greenhouse Gas Reduction," as modified by the notice titled "Elimination of Classification Requirement in the Green Technology Pilot Program," each of which was published in the Federal Register, if the Office determines that the claims are not obviously directed to a single invention.

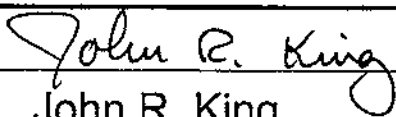
3. This request is accompanied by statements of special status for the eligibility requirement.

4. The application contains no more than three (3) independent claims and twenty (20) total claims.

5. The application does not contain any multiple dependent claims.

6. Other attachments: Eligibility Statement, Preliminary Amendment, Rescission Of Request For Non-Publication

Signature



Date

7-7-2010

Name

(Print/Typed)

John R. King

Registration Number

34,362**Note: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below.**

*Total of _____ forms are submitted.

The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTD-875 (07-08)

Approved for use through 12/31/2021. OMB 0550-0002
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTD-875					Application or Credit Number 12/562,084		Filing Date 07/13/2009		<input type="checkbox"/> To be Mailed		
APPLICATION AS FILED - PART I					OTHER THAN						
(Column 1)		(Column 2)		SMALL ENTITY <input checked="" type="checkbox"/> OR		SMALL ENTITY					
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR		RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.181(a), (b), or (c))	N/A	N/A	N/A	N/A							
<input type="checkbox"/> SEARCH FEE (37 CFR 1.181(d), (e), or (f))	N/A	N/A	N/A	N/A							
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.181(g), (h), or (i))	N/A	N/A	N/A	N/A							
TOTAL CLAIMS (37 CFR 1.181(j))	error 201	-	X \$ -	X \$ -							
INDEPENDENT CLAIMS (37 CFR 1.181(k))	error 201	-	X \$ -	X \$ -		X \$ -		X \$ -			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.181(l))			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$290 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 38 U.S.C. 41(a)(1)(G) and 37 CFR 1.181(l).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM FEE GRANT (37 CFR 1.181(m))											
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL		TOTAL				
APPLICATION AS AMENDED - PART II											
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR		SMALL ENTITY	
AMENDMENT	07/07/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)	OR		RATE (\$)	ADDITIONAL FEE (\$)
	Total of 20 claims	20	N/A	22	0	X \$ -	0			X \$ -	
	Independent (37 CFR 1.181(j))	2	N/A	3	0	X \$ -	0			X \$ -	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.181(l))										
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.181(m))										
					TOTAL APPL. FEE		0		TOTAL APPL. FEE		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)	OR		RATE (\$)	ADDITIONAL FEE (\$)
	Total of 0 claims	-	N/A	-	-	X \$ -	-			X \$ -	
	Independent (37 CFR 1.181(j))	-	N/A	-	-	X \$ -	-			X \$ -	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.181(l))										
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.181(m))										
					TOTAL APPL. FEE				TOTAL APPL. FEE		
* If the entry in column 1 is less than the entry in column 2, enter "0" in column 3. ** If the "Highest Number Previously Paid For" in THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number entered in the appropriate box in column 1.											

This collection of information is required by 37 CFR 1.10. The information is required to obtain or retain a benefit by the patent which is to be paid by the USPTO to process an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, organizing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1400, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-477-9191 and select option 2.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 1 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	4,403,644	09-13-1983	Hebert, Raymond T.	
	2	4,674,027	06-16-1987	Thomas J. Beckey	
	3	5,572,438	11-05-1996	Ehlers, et al.	
	4	5,717,609	02-10-1998	Packa, et al.	
	5	6,145,751	11-14-2000	Ahmed	
	6	6,178,362	01-23-2001	Woolard, et al.	
	7	6,351,693	02-26-2002	Monie	
	8	6,400,996	06-04-2002	Hoffberg, et al.	
	9	6,437,692	08-20-2002	Petite, et al.	
	10	6,478,233	11-12-2002	Shah	
	11	6,480,803	11-12-2002	Pierret, et al.	
	12	6,483,906	11-19-2002	Lggulden, et al.	
	13	6,536,675	03-25-2003	Pesko, et al.	
	14	6,542,076	04-01-2003	Joao	
	15	6,549,130	04-15-2003	Joao	
	16	6,574,537	06-02-2003	Kipersztok, et al.	
	17	6,580,950	06-17-2003	Johnson	
	18	6,594,825	07-15-2003	Goldschmidtiki, et al.	
	19	6,595,430	07-22-2003	Shah	
	20	6,598,056	07-22-2003	Hull, et al.	
	21	6,619,555	09-16-2003	Howard B. Rosen	
	22	6,622,097	09-16-2003	Robert R. Hunter	
	23	6,622,115	09-16-2003	Brown, et al.	
	24	6,622,925	09-23-2003	Carner, et al.	
	25	6,622,926	09-23-2003	Sartain, et al.	
	26	6,628,997	09-30-2003	Fox, et al.	
	27	6,633,823	10-14-2003	Bartone, et al.	
	28	6,643,567	11-04-2003	Kolk et al.	
	29	6,671,586	12-30-2003	Davis, et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
(Multiple sheets used when necessary)	Examiner	
SHEET 2 OF 4	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	30	6,695,218	02-24-2004	Fleckenstein	
	31	6,726,113	04-27-2004	Guo	
	32	6,731,992	05-04-2004	Ziegler	
	33	6,734,806	05-11-2004	Cratsley	
	34	6,772,052	08-03-2004	Amundsen	
	35	6,785,592	08-31-2004	Smith	
	36	6,785,630	08-31-2004	Kolk	
	37	6,789,739	09-14-2004	Howard Rosen	
	38	6,853,959	02-08-2005	Ikeda, et al.	
	39	6,868,293	03-15-2005	Schurr	
	40	6,868,319	03-15-2005	Kipersztok, et al.	
	41	6,882,712	04-19-2005	Iggulden, et al.	
	42	6,889,908	05-10-2005	Crippen, et al.	
	43	6,891,838	10-10-2005	Petite, et al.	
	44	6,991,029	01-31-2006	Orfield, et al.	
	45	7,009,493	03-07-2006	Howard	
	46	7,031,880	04-18-2006	Seem, et al.	
	47	7,039,532	05-02-2006	Hunter	
	48	7,089,088	08-08-2006	Terry, et al.	
	49	7,130,719	10-31-2006	Ehlers, et al.	
	50	7,130,832	10-31-2006	Bannai, et al.	
	51	7,167,079	01-23-2007	Smyth, et al.	
	52	7,187,986	03-06-2007	Johnson, et al.	
	53	7,205,892	04-17-2007	Luebke, et al.	
	54	7,215,746	05-08-2007	Iggulden, et al.	
	55	7,216,015	05-08-2007	Poth, Robert J.	
	56	7,231,424	06-11-2007	Bodin, et al.	
	57	7,232,075	06-19-2007	Rosen	
	58	2003/0040934 A1	02-27-2003	Skidmore, et al.	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
SHEET 3 OF 4	Examiner	
	Attorney Docket No.	JSTEIN.011A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	59	2005/0222889 A1	10-06-2005	Lai, et al.	
	60	2005/0288822 A1	12-29-2005	Rayburn, Ronald	
	61	2007/0043477 A1	02-22-2007	Elhers, et al.	
	62	2008/0083234 A1	04-10-2008	Krebs et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	63	ARNES, FEDERSPEIL, WANG, HUIZENG,., How Ambient Intelligence Will Improve Habitability and Energy Efficiency in Buildings, 2005, research paper., Center for the Built Environment. Controls and Information Technology	
	64	Comverge SuperStat Flyer	
	65	Control4 Wireless Thermostat Brochure	
	66	Cooper Power Systems Web Page	
	67	Enernoc Web Page	
	68	Enerwise Website	
	69	JOHNSON CONTORLS, Touch4 building automation system brochure, 2007	
	70	KILICOTTE, PIETTE, WATSON, , Dynamic Controls for Energy Efficiency and Demand Response: Framework Concepts and a New Construction Study Case in New York, Proceedings of the 2006 ACEEE Summer Study of Energy Efficiency in Buildings, Pacific Grove, CA., August 13-18, 2006	
	71	LIN, AUSLANDER and FEDERSPEIL, "Multi-Sensor Single-Actuator Control of HVAC Systems", 2002	
	72	PIER, Southern California Edison., Deman Responsive Control of Air Conditioning via Programmable Communicating Thermostats Draft Report	
	73	Proliphix Thermostat Brochure	

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Multiple sheets used when necessary)</i>	Application No.	12/502064
	Filing Date	07-13-2009
	First Named Inventor	Steinberg, John Douglas
	Art Unit	3744
	Examiner	
SHEET 4 OF 4	Attorney Docket No.	JSTEIN.011A

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹
	74	WANG, ARENS, FEDERSPIEL., "Opportunities to Save Energy and Improve Comfort by Using Wireless Sensor networks in Buildings," (2003), Center for Environmental Design Research	
	75	WETTER, WRIGHT, A comparison of deterministic and probabilistic optimization algorithms for nonsmooth simulation-based optimization., Building and Environment 39, 2004, Pages 989-999	

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121809

Examiner Signature	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	

T¹ - Place a check mark in this area when an English language Translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	6673695
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	Scott Edward Raevsky/Alexandra Benitez
Filer Authorized By:	Scott Edward Raevsky
Attorney Docket Number:	JSTEIN.011A
Receipt Date:	18-DEC-2009
Filing Date:	13-JUL-2009
Time Stamp:	20:13:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_011.pdf	35347 7ab2f5b27c1b1c0b0f1c1cc095ed0a06c0b8c7c9	yes	5

Case 6:20-cv-00078-ADA Document 68-2 Filed 04/29/21 Page 1893 of 2039

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Transmittal Letter			1	1	
Information Disclosure Statement (IDS) Filed (SB/08)			2	5	
Warnings:					
Information:					
2	NPL Documents	ARNES.pdf	1378534	no	16
			c:\ark\00000000\2017\09\14\180225\120007\ark\c...		
Warnings:					
Information:					
3	NPL Documents	Comverge.pdf	917053	no	2
			d:\0\00000000\2017\09\14\180225\120007\com...		
Warnings:					
Information:					
4	NPL Documents	Control4.pdf	1950689	no	2
			8\02\112\00000000\00000000\00000000\0000...		
Warnings:					
Information:					
5	NPL Documents	Cooper.PDF	1062463	no	12
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Warnings:					
Information:					
6	NPL Documents	Enermoc.PDF	585325	no	3
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Warnings:					
Information:					
7	NPL Documents	Enerwise.PDF	147015	no	2
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Warnings:					
Information:					
8	NPL Documents	Johnson.PDF	1033607	no	4
			10\000\00000000\00000000\00000000\00000000...		
Warnings:					
Information:					

9	NPL Documents	KILICOTTE.PDF	1002435 99b2118806a2229b5ad158a866a2dd196a7242d1	no	13
Warnings:					
Information:					
10	NPL Documents	LIN.PDF	576150 6312d655d111e85d86d4cd041eacbd1761c6cd9	no	11
Warnings:					
Information:					
11	NPL Documents	PIER.PDF	8672234 d1d42d178140a5501907d0b0290b92968c0b6cf	no	93
Warnings:					
Information:					
12	NPL Documents	Proliphix.pdf	886167 aba8a21691c75a6a950d931a078a6ac8b15908	no	2
Warnings:					
Information:					
13	NPL Documents	WANG.PDF	710120 3ecdc1b746d171a6e1761b7d8a585461e84f67d1	no	6
Warnings:					
Information:					
14	NPL Documents	Wetter.PDF	987315 40156d2195a299b5cc6a041d6d416d88Ba91d76d	no	11
Warnings:					
Information:					
Total Files Size (in bytes):			19944454		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT

Applicant	: Steinberg, John Douglas
App. No	: 12/502,064
Filed	: July 13, 2009
For	: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
Examiner	: Unknown
Art Unit	: 3744
Conf No.	: 5514

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing 75 references, of which 13 are enclosed/submitted.

This Information Disclosure Statement is being filed before the receipt of a first Office Action on the merits, and presumably no fee is required. If a first Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 C.F.R. § 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: December 18, 2009

By: /Scott Raevsky/
Scott Raevsky, Reg. No. 54,384
Attorney of Record
Customer No. 20995
(949) 721-7602



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 ADDRESS COMMISSIONER FOR PATENTS
 P.O. Box 150
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FILITE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/502,064	07/13/2009	3744	579	JSTEIN.011A	22	2

CONFIRMATION NO. 5514

UPDATED FILING RECEIPT



20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 10/07/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

John Douglas Steinberg, Millbrae, CA;

Power of Attorney: None**Domestic Priority data as claimed by applicant**

This appln claims benefit of 61/134,714 07/14/2008

Foreign Applications**If Required, Foreign Filing License Granted:** 07/22/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/502,064**

Projected Publication Date: Request for Non-Publication Acknowledged**Non-Publication Request:** Yes**Early Publication Request:** No**** SMALL ENTITY ****

Title

SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN
OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Preliminary Class

236

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

Docket No.: JSTEIN.011A

September 25, 2009

Page 1 of 1

Please Direct All Correspondence to Customer Number 20,995

RESPONSE TO FORMALITIES NOTICE

Applicant : John Douglas Steinberg
App. No : 12/502,064
Filed : July 13, 2009
For : SYSTEM AND METHOD FOR
USING A NETWORKED
ELECTRONIC DEVICE AS AN
OCCUPANCY SENSOR FOR AN
ENERGY MANAGEMENT SYSTEM
Art Unit : 3744
Conf. No. : 5514

**Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

Dear Sir:

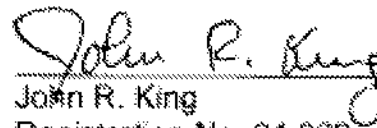
The above-captioned application was filed without a Declaration and/or filing fees. Enclosed in compliance with 37 CFR 1.53(f) are the following.

(X) A Declaration in 1 pages.

The present application qualifies for small entity status under 37 CFR § 1.27.

(X) Fees will be paid via EFS Web. Extension of time is requested by payment of any extension fee.

The Commissioner is hereby authorized to charge any additional fees which may be required, now or in the future, or credit any overpayment, to Account No. 11-1410.


John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

7358034:sd
062509

**DECLARATION FOR UTILITY OR DESIGN APPLICATION
UNDER 37 CFR 1.63**

Docket No.: JSTEIN.011A

Page 1 of 1

Title: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE
AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Inventors: John Douglas Steinberg

Please Direct All Correspondence to Customer Number 20,995

This Declaration is directed to the invention that:

Was filed as Serial No. 12/502,064 filed on July 13, 2009

As a below named inventor:

I believe the inventor named below to be the original and first inventor of the subject matter which is described and claimed and for which a patent is sought;

I have reviewed and understand the contents of the above-identified application, including the claims, and any amendment filed herewith or identified above;

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56;

The application was originally filed with an Application Data Sheet (ADS). The ADS sets forth any applicable Foreign Priority Claims under 35 USC § 119, and sets forth the full mailing and residence address of each inventor whose signature appears below as allowed under 37 CFR 1.63(c). The ADS also sets forth any Domestic Priority Claims under 35 USC §§ 119(e), 120, 121, and 365.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor: John Douglas Steinberg

Signature:

Citizenship:

United States

Date:

9/23/09

Send Correspondence To:

KNOBBE, MARTENS, OLSON & BEAR, LLP

Customer No. 20,995

7845463:ad/092309

Electronic Patent Application Fee Transmittal

Application Number:	12502064			
Filing Date:	13-Jul-2009			
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	John R. King/Amy Durrant			
Attorney Docket Number:	JSTEIN.011A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Claims in excess of 20	2202	2	26	52
Miscellaneous-Filing:				
Late filing fee for oath or declaration	2051	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				579

Electronic Acknowledgement Receipt

EFS ID:	6145427
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Nicole Jones
Filer Authorized By:	John R. King
Attorney Docket Number:	JSTEIN.011A
Receipt Date:	25-SEP-2009
Filing Date:	13-JUL-2009
Time Stamp:	12:25:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$579
RAM confirmation Number	11429
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.245 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	JSTEIN-011A_MP.pdf	35199 9474c1911bf199fa30417dbba892dc7c1b499da367ad0	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	JSTEIN-011A_declaration.pdf	55743 21867489ab89c630ff1251abce2aa701ab6b8f3d3c	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	38605 c08a81ff7a728668a195ac0f6b8104ca783b	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			129547		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 150
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/502,064	07/13/2009	John Douglas Steinberg	JSTEIN.011A

CONFIRMATION NO. 5514

FORMALITIES LETTER



OC000000037051039

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 07/28/2009

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$82 to complete the basic filing fee for a small entity.
- The oath or declaration is missing.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$52** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of **\$65** for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$579** for a small entity

- **\$82** Statutory basic filing fee.
- **\$65** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$270** to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$110** to complete the examination fee for a small entity in compliance with 37 CFR 1.27.
- Total additional claim fee(s) for this application is **\$52**
 - **\$52** for **2** total claims over 20.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/mhaile/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 ADDRESS COMMISSIONER FOR PATENTS
 P.O. Box 150
 Alexandria, Virginia 22313-1150
 www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/502,064	07/13/2009	3744	0.00	JSTEIN.011A	22	2

CONFIRMATION NO. 5514

20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

FILING RECEIPT



0000000037051038

Date Mailed: 07/28/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

John Douglas Steinberg, Millbrae, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/134,714 07/14/2008

Foreign Applications

If Required, Foreign Filing License Granted: 07/22/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/502,064**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

** SMALL ENTITY **

Title

SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN
OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Preliminary Class

236

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PTO/SB/14 (07-07)

Approved for use through 09/30/2019. OMB 0651-0002

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid (PRA) control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	JSTEIN.011A
		Application Number	
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Applicant Information:

Applicant 1				
Applicant Authority		<input checked="" type="radio"/> Inventor <input type="radio"/> Legal Representative under 35 U.S.C. 117 <input type="radio"/> Party of Interest under 35 U.S.C. 118		
Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Douglas	Stenberg	
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Millbrae	State/Province	CA	Country of Residence
				US
Citizenship under 37 CFR 1.41(b)		US		
Mailing Address of Applicant:				
Address 1		873 Hacienda Way		
Address 2				
City	Millbrae	State/Province	CA	
Postal Code	94030	Country	US	
All Inventors Must Be Listed - Additional inventor information blocks may be generated within this form by selecting the Add button.				
				<input type="button" value="Add"/>

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.			
Customer Number	20995		
Email Address	efiling@knmc.com		<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

Application Information:

Title of the Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		
Attorney Docket Number	JSTEIN.011A	Small Entity Status Claimed <input checked="" type="checkbox"/>	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)	Sub Class (if any)		
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

PTC/32814 (07-07)

Approved for use through 06/30/2019. (USPTO 0857-0152)

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	JSTEIN.011A
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM	

Publication Information:
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One: ☒ Customer Number ☐ US Patent Practitioner ☐ Limited Recognition (37 CFR 11.9)

Customer Number: 29995

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61134714	2008-07-14

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove			
Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			<input type="radio"/> Yes <input checked="" type="radio"/> No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1

PTO/SB/M (07/07)

Approved for use through 06/06/2018 OMB 0601-0032

U.S. Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	JSTEIN 011A
		Application Number	
Title of Invention	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM		

If the Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information:				
Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee Data may be generated within this form by selecting the Add button.				

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.				
Signature	John R. King		Date (YYYY-MM-DD)	2009-07-15
First Name	John	Last Name	King	Registration Number
				34362

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PATENT

**SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE
AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM**

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 61/134,714, filed July 14, 2008, the entirety of which is incorporated herein by reference and is to be considered part of this specification.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates to the use of thermostatic HVAC and other energy management controls that are connected to a computer network. More specifically, the present invention pertains to the use of user interactions with an interface such as a personal computer or an Internet-enabled television as signal related to occupancy to inform an energy management system.

[0003] Heating and cooling systems for buildings (heating, ventilation and cooling, or HVAC systems) have been controlled for decades by thermostats. At the most basic level, a thermostat includes a means to allow a user to set a desired temperature, a means to sense actual temperature, and a means to signal the heating and/or cooling devices to turn on or off in order to try to change the actual temperature to equal the desired temperature. The most basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature and a mercury switch that opens or completes a circuit when the spring coils or uncoils with temperature changes. More recently, electronic digital thermostats have become prevalent. These thermostats use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.

[0004] These programmable thermostats generally offer a very restrictive user interface, limited by the cost of the devices, the limited real estate of the small wall-mounted boxes, and the inability to take into account more than two variables: the desired temperature set by the user, and the ambient temperature sensed by the thermostat. Users can generally only set one series of commands per day, and in order to change one parameter (e.g., to change the late-night temperature) the user often has to cycle through several other parameters by repeatedly pressing one or two buttons.

[0005] Because the interface of programmable thermostats is so poor, the significant theoretical savings that are possible with them (sometimes cited as 25% of heating and cooling costs) are rarely realized. In practice, studies have found that more than 50% of users never program their thermostats at all. Significant percentages of the thermostats that are programmed are programmed sub-optimally, in part because, once programmed, people tend to not to re-invest the time needed to change the settings very often.

[0006] A second problem with standard programmable thermostats is that they represent only a small evolutionary step beyond the first, purely mechanical thermostats. Like the first thermostats, they only have two input signals - ambient temperature and the preset desired temperature. The entire advance with programmable thermostats is that they can shift between multiple present temperatures at different times without real-time involvement of a human being.

[0007] Because most thermostats control HVAC systems that do not offer infinitely variable output, traditional thermostats are designed to permit the temperature as seen by the thermostat to vary above and below the setpoint to prevent the HVAC system from constantly and rapidly cycling on and off, which is inefficient and harmful to the HVAC system. The temperature range in which the thermostat allows the controlled environment to drift is known as both the dead zone and, more formally, the hysteresis zone. The hysteresis zone is frequently set at +/- 1 degree Fahrenheit. Thus if the setpoint is 68 degrees, in the heating context the thermostat will allow the inside temperature to fall to 67 degrees before turning the heating system on, and will allow it to rise to 69 degrees before turning it off again.

[0008] As energy prices rise, more attention is being paid to ways of reducing energy consumption. Because energy consumption is directly proportional to setpoint - that is, the further a given setpoint diverges from the balance point (the inside temperature assuming no HVAC activity) in a given house under given conditions, the higher energy consumption will be to maintain temperature at that setpoint), energy will be saved by virtually any strategy that over a given time frame lowers the average heating setpoint or raises the cooling setpoint. Conventional programmable thermostats allow homeowners to save money and energy by pre-programming setpoint changes based upon comfort or schedule. For example, in the summer, allowing the setpoint to rise by several degrees (or even shutting off the air conditioner) when the home is unoccupied will generally save significantly on energy. But such thermostats have proven to be only minimally effective in practice. Because they have such primitive user interfaces, they are difficult to program, and so many users never bother at all, or set them up once and do not alter the programming even if their schedules change.

[0009] In the hotel industry, the heating and cooling decisions made in hundred or even thousands of individual rooms with independently controlled HVAC systems are aggregated into a single energy bill, so hotel owners and managers are sensitive to energy consumption by those systems. Hotel guests often turn the air conditioner to a low temperature setting and then leave the room for hours at a time, thereby wasting considerable energy. An approach commonly used outside of the United States to combat this problem is to use a keycard to control the HVAC system, such that guests place the keycard into a slot mounted on the wall near the door of the room which then triggers the lights and HVAC system to power up, and turn them off when the guest removes the card upon leaving the room. However, because most hotels give each guest two cards, it is easy to simply leave the extra card in the slot, thus defeating the purpose of the system. Recently, systems have been introduced in which a motion sensor is connected to the control circuitry for the HVAC system. If no motion is detected in the room for some predetermined interval, the system concludes that the room is unoccupied, and turns off or alters the setpoint of the HVAC system to a more economical level. When the motion sensor detects motion (which is

assumed to coincide with the return of the guest), the HVAC system resets to the guest's chosen setting.

[0010] Adding occupancy detection capability to residential HVAC systems could also add considerable value in the form of energy savings without significant tradeoff in terms of comfort. But the systems used in hotels do not easily transfer to the single-family residential context. Hotel rooms tend to be small enough that a single motion sensor is sufficient to determine with a high degree of accuracy whether or not the room is occupied. A single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor. The most economical way to include a motion sensor in a traditional programmable thermostat would be to build it into the thermostat itself. But thermostats are generally located in hallways, and thus are unlikely to be exposed to the areas where people tend to spend their time. Wiring a home with multiple motion sensors in order to maximize the chances of detecting occupants would involve considerable expense, both for the sensors themselves and for the considerable cost of installation, especially in the retrofit market. Yet if control is ceded to a single-sensor system that cannot reliably detect presence, the resulting errors would likely lead the homeowner to reject the system.

[0011] It would thus be desirable to provide a system that could detect occupancy without requiring the installation of additional hardware; that could accurately detect occupancy regardless of which room in the house is occupied, and could optimize energy consumption based upon dynamic and individually configurable heuristics.

SUMMARY OF THE INVENTION

[0012] In one embodiment, the invention comprises a thermostat attached to an HVAC system, a local network connecting the thermostat to a larger network such as the Internet, and one or more computers attached to the network, and a server in bi-directional communication with a plurality of such thermostats and computers. The server pairs each thermostat with one or more computers or other consumer electronic devices which are determined to be associated with the home in which the thermostat is located. The server logs the ambient temperature sensed by each thermostat vs. time and the signals sent by the

thermostats to their HVAC systems. The server also monitors and logs activity on the computers or other consumer electronic devices associated with each thermostat. Based on the activity patterns evidenced by keystrokes, cursor movement or other inputs, or lack thereof, the server instructs the thermostat to change temperature settings between those optimized for occupied and unoccupied states.

[0013] At least one embodiment of the invention comprises the steps of determining whether one or more networked electronic devices inside a structure are in use; determining whether said use of said networked electronic devices indicates occupancy of said structure; and adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.

[0014] At least one embodiment of the invention comprises at least one said thermostat having at least one temperature setting associated with the presence of one or more occupants in said structure, and at least one temperature setting associated with the absence of occupants in said structure; one or more electronic devices having at least a user interface; where said electronic devices and said thermostat are connected to a network; where said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 shows an example of an overall environment in which an embodiment of the invention may be used.

[0016] Figure 2 shows a high-level illustration of the architecture of a network showing the relationship between the major elements of one embodiment of the subject invention.

[0017] Figure 3 shows an embodiment of the website to be used as part of the subject invention.

[0018] Figure 4 shows a high-level schematic of the thermostat used as part of the subject invention.

[0019] Figure 5 shows one embodiment of the database structure used as part of the subject invention.

[0020] Figure 6 shows the browser as seen on the display of the computer used as part of the subject invention.

[0021] Figure 7 is a flowchart showing the steps involved in the operation of one embodiment of the subject invention.

[0022] Figure 8 is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] **Figure 1** shows an example of an overall environment 100 in which an embodiment of the invention may be used. The environment 100 includes an interactive communication network 102 with computers 104 connected thereto. Also connected to network 102 are one or more server computers 106, which store information and make the information available to computers 104. The network 102 allows communication between and among the computers 104 and 106.

[0024] Presently preferred network 102 comprises a collection of interconnected public and/or private networks that are linked to together by a set of standard protocols to form a distributed network. While network 102 is intended to refer to what is now commonly referred to as the Internet, it is also intended to encompass variations which may be made in the future, including changes additions to existing standard protocols.

[0025] When a user of the subject invention wishes to access information on network 102, the buyer initiates connection from his computer 104. For example, the user invokes a browser, which executes on computer 104. The browser, in turn, establishes a communication link with network 102. Once connected to network 102, the user can direct the browser to access information on server 106.

[0026] One popular part of the Internet is the World Wide Web. The World Wide Web contains a large number of computers 104 and servers 106, which store HyperText Markup Language (HTML) documents capable of displaying graphical and textual information. HTML is a standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents.

[0027] The servers 106 that provide offerings on the World Wide Web are typically called websites. A website is often defined by an Internet address that has an associated electronic page. Generally, an electronic page is a document that organizes the presentation of text graphical images, audio and video.

[0028] In addition to the Internet, the network 102 can comprise a wide variety of interactive communication media. For example, network 102 can include local area networks, interactive television networks, telephone networks, wireless data systems, two-way cable systems, and the like.

[0029] In one embodiment, computers 104 and servers 106 are conventional computers that are equipped with communications hardware such as modem or a network interface card. The computers include processors such as those sold by Intel and AMD. Other processors may also be used, including general-purpose processors, multi-chip processors, embedded processors and the like.

[0030] Computers 104 can also be handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network. Computers 104 can also be microprocessor- controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.

[0031] Computers 104 may utilize a browser configured to interact with the World Wide Web. Such browsers may include Microsoft Explorer, Mozilla, Firefox, Opera or Safari. They may also include browsers or similar software used on handheld, home entertainment and wireless devices. The storage medium may comprise any method of storing information. It may comprise random access memory (RAM), electronically erasable programmable read only memory (EEPROM), read only memory (ROM), hard disk, floppy disk, CD-ROM, optical memory, or other method of storing data. Computers 104 and 106

may use an operating system such as Microsoft Windows, Apple Mac OS, Linux, Unix or the like. Computers 106 may include a range of devices that provide information, sound, graphics and text, and may use a variety of operating systems and software optimized for distribution of content via networks.

[0032] **Figure 2** illustrates in further detail the architecture of the specific components connected to network 102 showing the relationship between the major elements of one embodiment of the subject invention. Attached to the network are thermostats 108 and computers 104 of various users. Connected to thermostats 108 are HVAC units 110. The HVAC units may be conventional air conditioners, heat pumps, or other devices for transferring heat into or out of a building. Each user is connected to the server 106 via wired or wireless connection such as Ethernet or a wireless protocol such as IEEE 802.11, a gateway 110 that connects the computer and thermostat to the Internet via a broadband connection such as a digital subscriber line (DSL) or other form of broadband connection to the World Wide Web. Server 106 contains the content to be served as web pages and viewed by computers 104, as well as databases containing information used by the servers.

[0033] In the currently preferred embodiment, the website 200 includes a number of components accessible to the user, as shown in **Figure 3**. Those components may include a means to enter temperature settings 202, a means to enter information about the user's home 204, a means to enter the user's electricity bills 206, means to calculate energy savings that could result from various thermostat-setting strategies 208, and means to enable and choose between various arrangements 210 for demand reduction with their electric utility provider as intermediated by the demand reduction service provider.

[0034] **Figure 4** shows a high-level block diagram of thermostat 108 used as part of the subject invention. Thermostat 108 includes temperature sensing means 252, which may be a thermistor, thermal diode or other means commonly used in the design of electronic thermostats. It includes a microprocessor 254, memory 256, a display 258, a power source 260, a relay 262, which turns the HVAC system on and off in response to a signal from the microprocessor, and contacts by which the relay is connected to the wires that lead to the HVAC system. To allow the thermostat to communicate bi-directionally with the computer network, the thermostat also includes means 264 to connect the thermostat to a local

computer or to a wireless network. Such means could be in the form of Ethernet, wireless protocols such as IEEE 802.11, IEEE 802.15.4, Bluetooth, cellular systems such as CDMA, GSM and GPRS, or other wireless protocols. The thermostat 250 may also include controls 266 allowing users to change settings directly at the thermostat, but such controls are not necessary to allow the thermostat to function.

[0035] The data used to generate the content delivered in the form of the website is stored on one or more servers 106 within one or more databases. As shown in **Figure 5**, the overall database structure 300 may include temperature database 400, thermostat settings database 500, energy bill database 600, HVAC hardware database 700, weather database 800, user database 900, transaction database 1000, product and service database 1100 and such other databases as may be needed to support these and additional features.

[0036] The website 200 will allow users of connected thermostats 250 to create personal accounts. Each user's account will store information in database 900, which tracks various attributes relative to users of the site. Such attributes may include the make and model of the specific HVAC equipment in the user's home; the age and square footage of the home, the solar orientation of the home, the location of the thermostat in the home, the user's preferred temperature settings, whether the user is a participant in a demand reduction program, etc.

[0037] As shown in **Figure 3**, the website 200 will permit thermostat users to perform through the web browser substantially all of the programming functions traditionally performed directly at the physical thermostat, such as temperature set points, the time at which the thermostat should be at each set point, etc. Preferably the website will also allow users to accomplish more advanced tasks such as allow users to program in vacation settings for times when the HVAC system may be turned off or run at more economical settings, and set macros that will allow changing the settings of the temperature for all periods with a single gesture such as a mouse click.

[0038] **Figure 6** represents the screen of a computer or other device 104 using a graphical user interface connected to the Internet. The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement,

keystrokes or otherwise, and signals the application running on server 106 that activity has been detected. Server 106 may then, depending on context, (a) transmit a signal to thermostat 108 changing setpoint because occupancy has been detected at a time when the system did not expect occupancy; (b) signal the background application running on computer 104 to trigger a software routine that instantiates a pop-up window 1202 that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by clicking the cursor on "yes" button 1204 or "No" button 1206. Equivalent means of signalling activity may be employed with interactive television programming, gaming systems, etc.

[0039] **Figure 7** represents a flowchart showing the steps involved in the operation of one embodiment of the subject invention. In step 1302, computer 104 transmits a message to server 106 via the Internet indicating that there is user activity on computer 104. This activity can be in the form of keystrokes, cursor movement, input via a television remote control, etc. In step 1304 the application queries database 300 to retrieve setting information for the HVAC system. In step 1306 the application determines whether the current HVAC program is intended to apply when the home is occupied or unoccupied. If the HVAC settings then in effect are intended to apply for an occupied home, then the application terminates for a specified interval. If the HVAC settings then in effect are intended to apply when the home is unoccupied, then in step 1308 the application will retrieve from database 300 the user's specific preferences for how to handle this situation. If the user has previously specified (at the time that the program was initially set up or subsequently modified) that the user prefers that the system automatically change settings under such circumstances, the application then proceeds to step 1316, in which it changes the programmed setpoint for the thermostat to the setting intended for the house when occupied. If the user has previously specified that the application should not make such changes without further user input, then in step 1310 the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home. If the user selects to retain the current setting, then in step 1314 the application will write to database 300 the fact that the users has so elected and terminate.

If the user elects to change the setting, then in step 1316 the application transmits the revised setpoint to the thermostat. In step 1314 the application writes the updated setting information to database 300.

[0040] **Figure 8** is a flowchart that shows how the invention can be used to select different HVAC settings based upon its ability to identify which of multiple potential occupants is using the computer attached to the system. In step 1402 computer 104 transmits to server 106 information regarding the type of activity detected on computer 104. Such information could include the specific program or channel being watched if, for example, computer 104 is used to watch television. The information matching, for example, TV channel 7 at 4:00 PM on a given date to specific content may be made by referring to Internet-based or other widely available scheduling sources for such content. In step 1404 server 106 retrieves from database 300 previously logged data regarding viewed programs. In step 1406 server 106 retrieves previously stored data regarding the residents of the house. For example, upon initiating the service, one or more users may have filled out online questionnaires sharing their age, gender, schedules, viewing preferences, etc. In step 1408, server 106 compares the received information about user activity to previously stored information retrieved from database 300 about the occupants and their viewing preferences. For example, if computer 104 indicates to server 106 that the computer is being used to watch golf, the server may conclude that an adult male is watching; if computer 104 indicates that it is being used to watch children's programming, server 106 may conclude that a child is watching. In step 1410 the server transmits a query to the user in order to verify the match, asking, in effect, "Is that you, Bob?" In step 1412, based upon the user's response, the application determines whether the correct user has been identified. If the answer is no, then the application proceeds to step 1416. If the answer is yes, then in step 1414 the application retrieves the temperature settings for the identified occupant. In step 1416 the application writes to database 300 the programming information and information regarding matching of users to that programming.

[0041] In an alternative embodiment, the application running on computer 104 may respond to general user inputs (that is, inputs not specifically intended to instantiate communication with the remote server) by querying the user whether a given action should

be taken. For example, in a system in which the computer 104 is a web-enabled television or web-enabled set-top device connected to a television as a display, software running on computer 104 detects user activity, and transmits a message indicating such activity to server 106. The trigger for this signal may be general, such as changing channels or adjusting volume with the remote control or a power-on event. Upon receipt by server 104 of this trigger, server 104 transmits instructions to computer 104 causing it to display a dialog box asking the user whether the user wishes to change HVAC settings.

WHAT IS CLAIMED IS:

1. A method for varying temperature setpoints for an HVAC system comprising:
determining whether one or more networked electronic devices inside a structure are in use;
determining whether said use of said networked electronic devices indicates occupancy of said structure; and
adjusting the temperature setpoint on a thermostatic controller for an HVAC system for said structure based upon whether or not said structure is deemed to be occupied.
2. The method of Claim 1 in which said networked electronic device is a television.
3. The method of Claim 1 in which said networked electronic device is a personal computer.
4. The method of Claim 1 in which said networked electronic device is connected to the Internet.
5. The method of Claim 1 in which programming being watched or listened to using said networked electronic device is used to determine which occupant of said structure is likely to be present, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said networked electronic device.
6. The method of Claim 1 in which said networked electronic device is a game console.
7. The method of Claim 1 in which said networked electronic device communicates with a remote server.
8. The method of Claim 1 in which said adjusting of said temperature setpoints is logged to a database.
9. The method of Claim 1 in which said adjusting of said temperature setpoints is initiated by a remote computer.
10. The method of Claim 1 in which said temperature setpoints are varied automatically.

11. The method of Claim 1 in which an occupant is prompted to confirm occupancy prior to the adjusting of said temperature setpoint.

12. A system for altering the setpoint on a thermostat for space conditioning of a structure comprising:

at least one thermostat having at least one temperature setting associated with the presence of one or more occupants in a structure, and at least one temperature setting associated with the absence of occupants in said structure;

one or more electronic devices having at least a user interface;

wherein said electronic devices and said thermostat are connected to a network; and

wherein said setpoint on said thermostat is adjusted between said temperature setting associated with the presence of one or more occupants in said structure and said temperature setting associated with the absence of occupants in said structure based upon the use of said user interface for said electronic device.

13. The system of Claim 12 in which said electronic device is a television.

14. The system of Claim 12 in which said electronic device is a personal computer.

15. The system of Claim 12 in which said electronic device is connected to the Internet.

16. The system of Claim 12 in which the programming being watched or listened to using said networked electronic device is used to determine which occupant of said structure is likely to be using said networked electronic device, and the setpoint for said thermostatic controller is selected based upon the preferences of the occupant determined to be using said networked electronic device.

17. The system of Claim 12 in which said networked electronic device is a game console.

18. The system of Claim 12 in which said networked electronic device communicates with a remote server.

19. The system of Claim 12 in which variation of temperature setpoints is logged to a database.

20. The system of Claim 12 in which variation of temperature setpoints is initiated by a remote computer.

21. The system of Claim 12 in which said temperature setpoints are varied automatically.

22. The system of Claim 12 in which an occupant is prompted to confirm occupancy prior to adjustment of said temperature setpoint.

**SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE
AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM**

ABSTRACT OF THE DISCLOSURE

The invention comprises systems and methods for detecting the use of networked consumer electronics devices as indications of occupancy of a structure for purposes of automatically adjusting the temperature setpoint on a thermostatic HVAC control. At least one thermostat is located inside a structure and is used to control an HVAC system in the structure. At least one networked electronic device is used to indicate the state of occupancy of the structure. The state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of unoccupied spaces.

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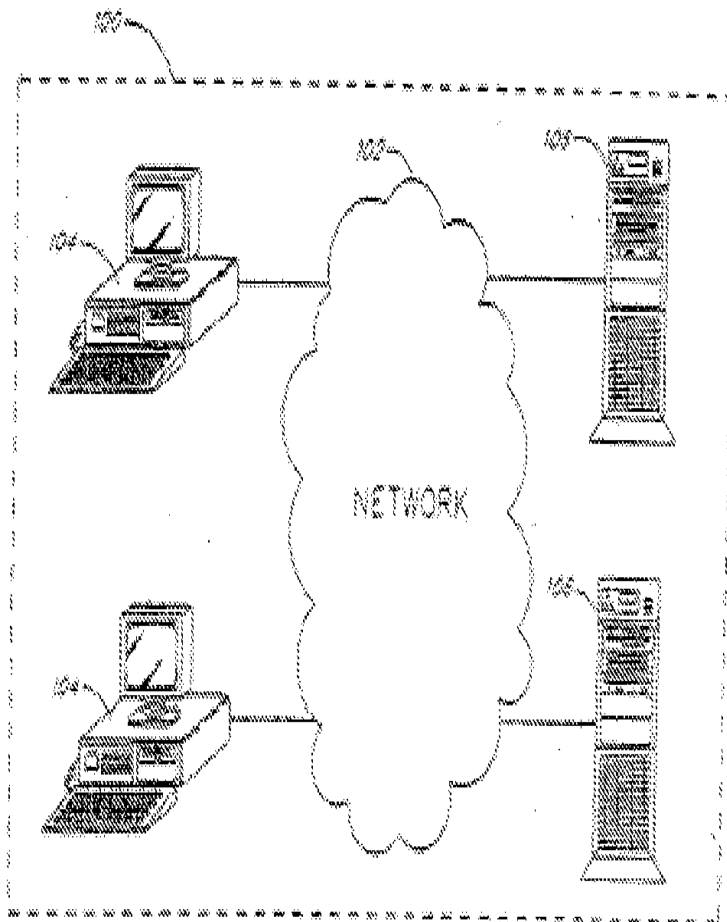


FIG. 1

0272

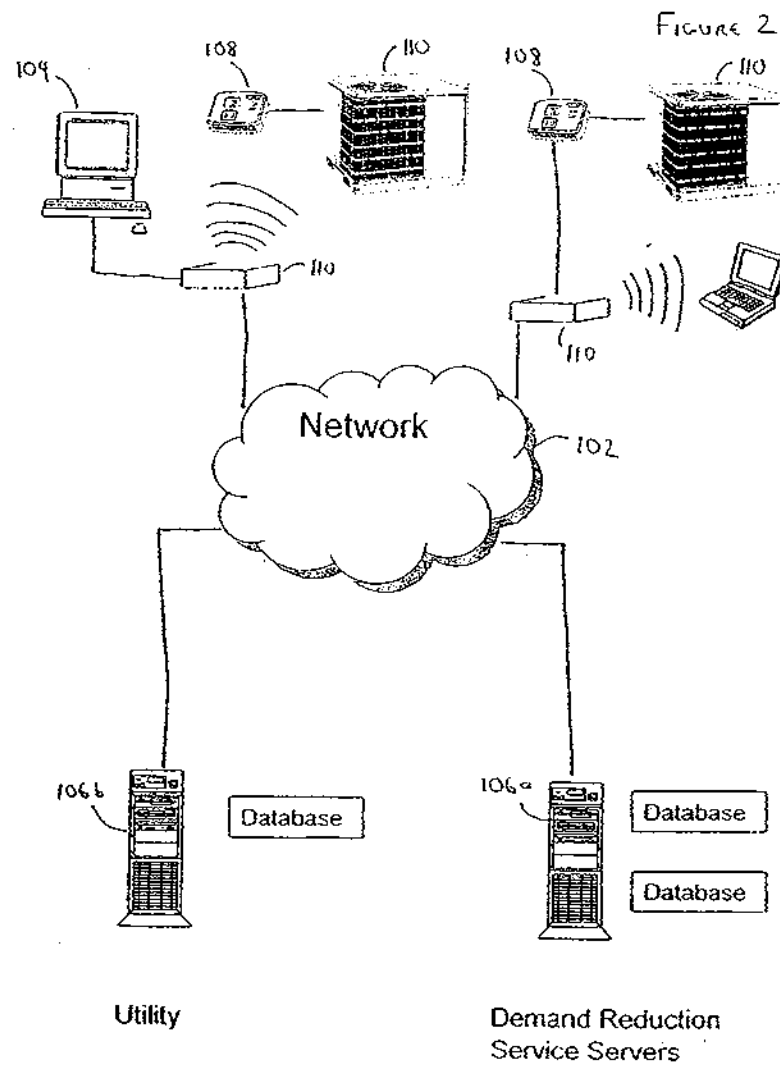


Figure 3

200

204

208

210

206

202

Address:
Square Feet:

Electric Bill:

January	\$	_____
February	\$	_____
March	\$	_____
April	\$	_____
May	\$	_____

Macro #1 would save you
\$347/year

Macro #2 would save you
\$630/year

Sign up for comfort PDR

Sign up for max PDR

Mon
Tues
Wed
Thur
Fri
Sat
Sun

78
72
68

FIGURE 4

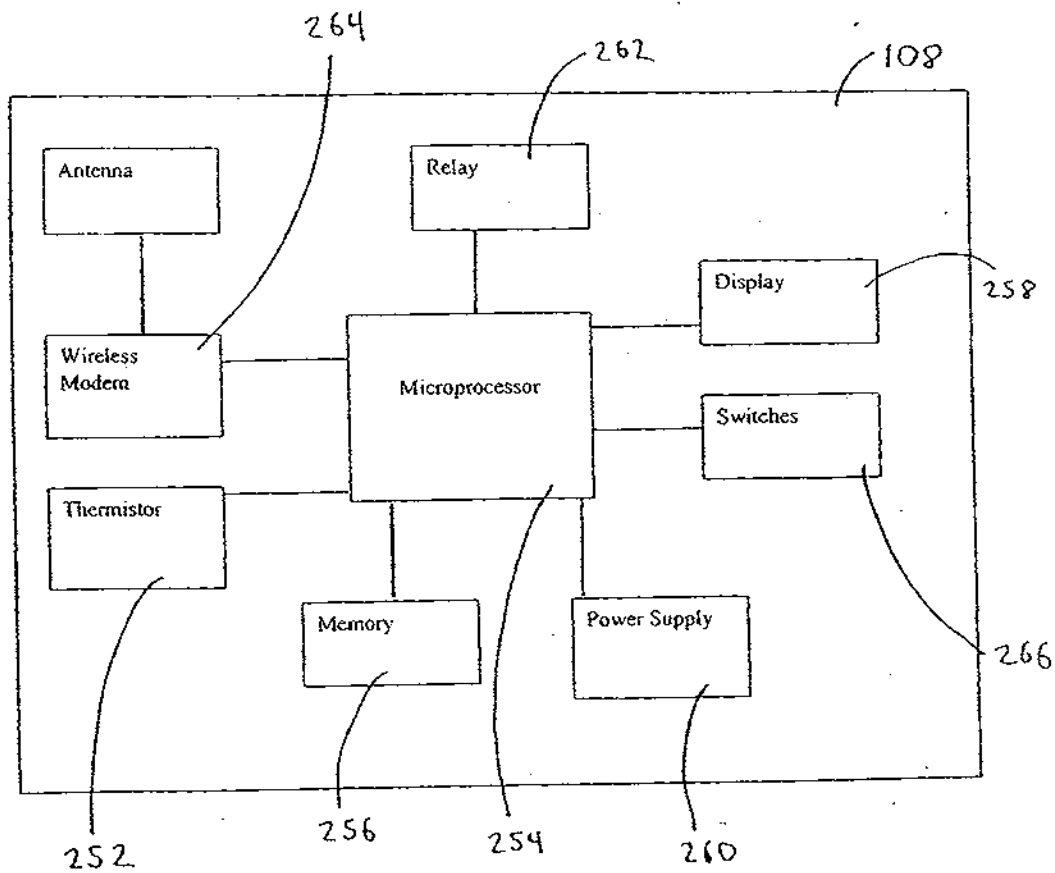


FIGURE 5

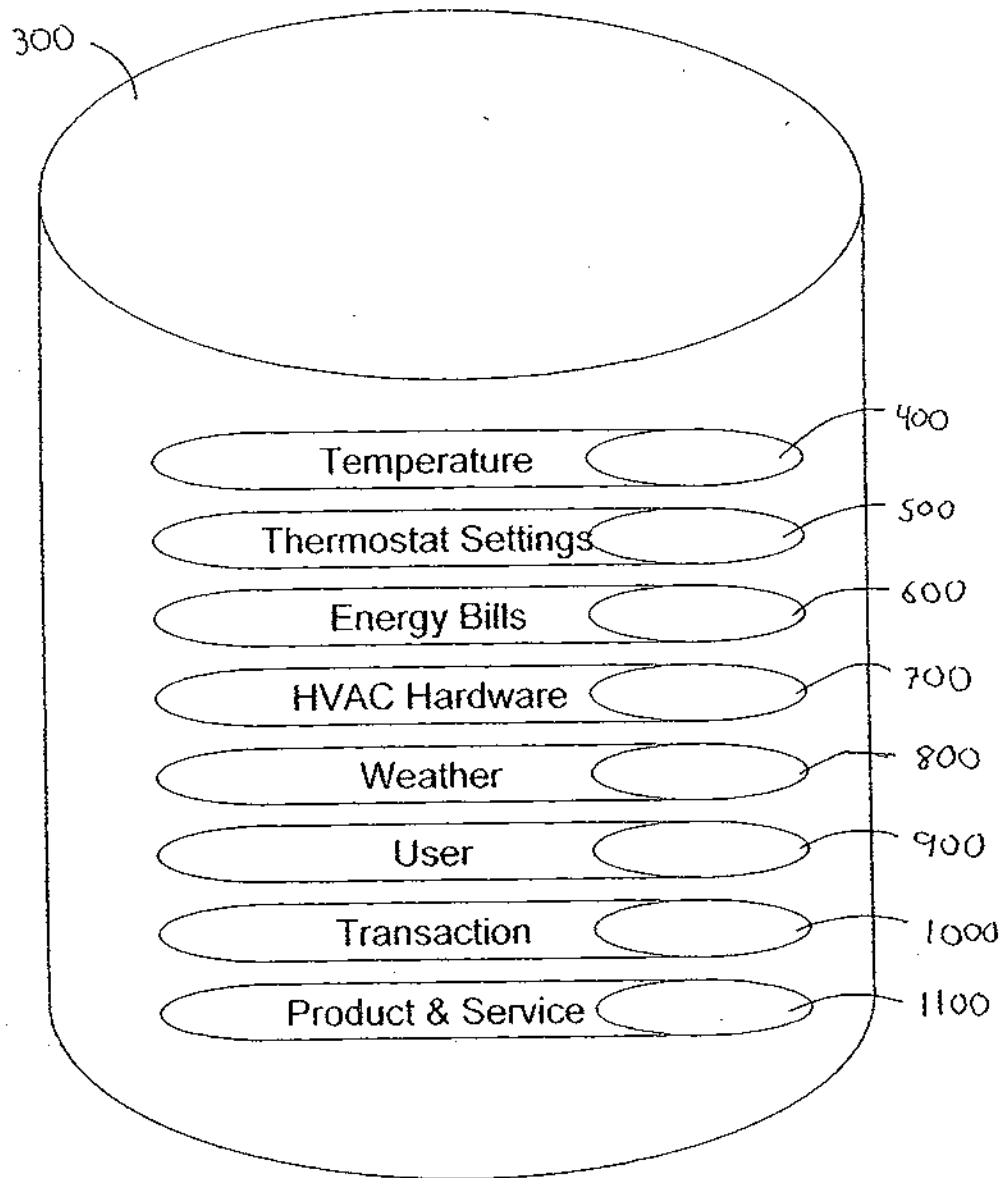


Fig 6

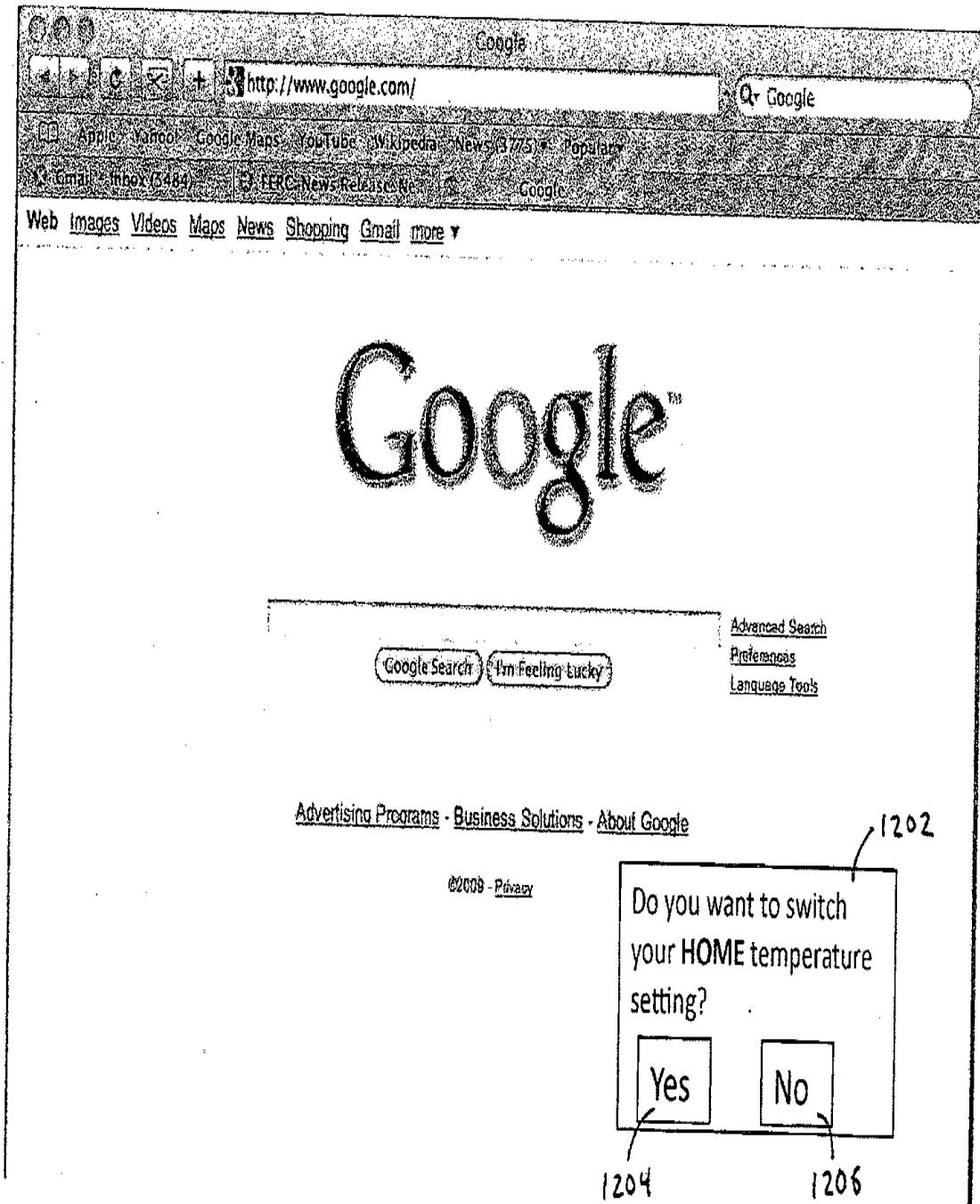


Fig 7

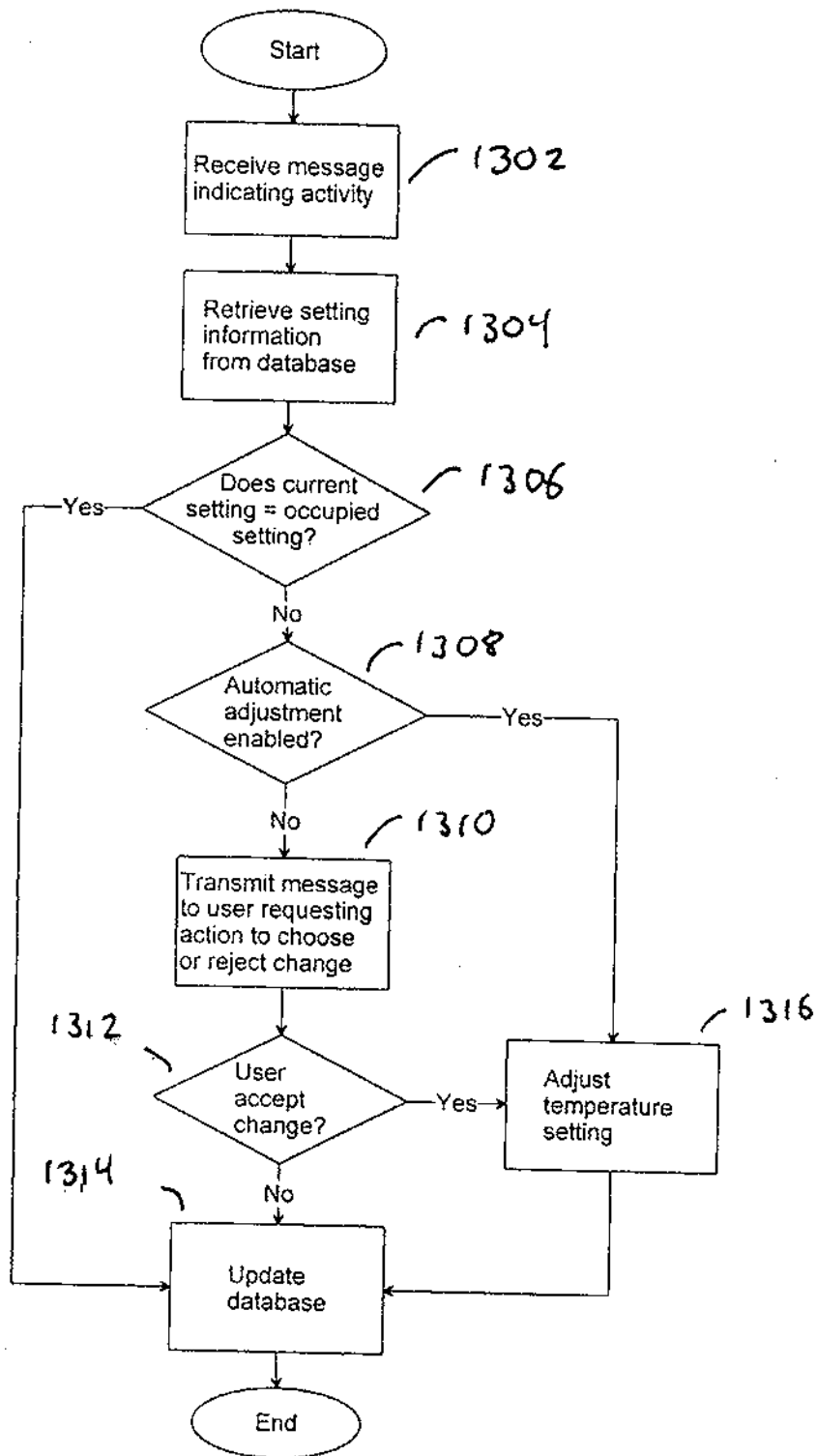
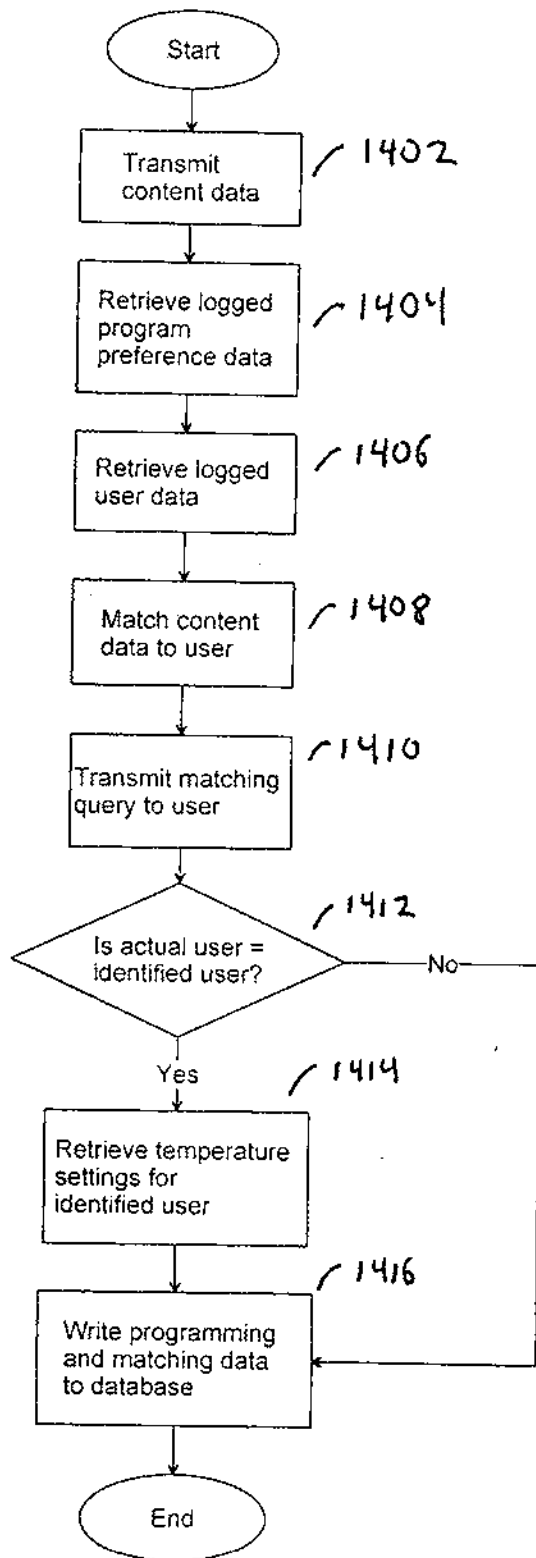


Fig 8



Electronic Acknowledgement Receipt

EFS ID:	5692168
Application Number:	12502064
International Application Number:	
Confirmation Number:	5514
Title of Invention:	SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	20995
Filer:	John R. King/Alexandra Benitez
Filer Authorized By:	John R. King
Attorney Docket Number:	JSTEIN.011A
Receipt Date:	13-JUL-2009
Filing Date:	
Time Stamp:	18:40:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	JSTEIN-011A_ADS.pdf	242737 fc01dc028a215ad1b5556a6e000b1fa81b3e9e	no	4

Warnings:**Information:**

0280

This is not an USPTO supplied ADS fillable form

2		JSTEIN-011A_spec.pdf	753309	yes	16
			8f0b0c1ba0d97c60757e6c8e21196709498604		
Multipart Description/PDF files in .zip description					
		Document Description	Start	End	
		Specification	1	12	
		Claims	13	15	
		Abstract	16	16	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	JSTEIN-011A_drawings.pdf	214996	no	8
			a29ca008b778e15676d1178ba219c0d10b8e47d		
Warnings:					
Information:					
Total Files Size (in bytes):			1211042		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Filing Date: 07/13/09

Approved for use through 7/31/2006 OMB 5051-0032

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD					12/502,064	
Substitute for Form PTO-SB75						
APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.18(a), (b), or (c))	N/A	N/A	N/A	82	N/A	
SEARCH FEE (37 CFR 1.18(b), (d), or (e))	N/A	N/A	N/A	270	N/A	
EXAMINATION FEE (37 CFR 1.18(a), (d), or (e))	N/A	N/A	N/A	110	N/A	
TOTAL CLAIMS (37 CFR 1.18(f))	22	2	\$526	52	52	
INDEPENDENT CLAIMS (37 CFR 1.18(g))	2	0	110		228	
APPLICATION SIZE FEE (37 CFR 1.18(h))			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(a).			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.18(j))						
			TOTAL	517	TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
CLAMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
Total (37 CFR 1.18(b))	Minus **	=	X =		X =	
Independent (37 CFR 1.18(c))	Minus ***	=	X =		X =	
Application Size Fee (37 CFR 1.18(h))						
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.18(j))						
			TOTAL	ADD'T FEE	TOTAL	ADD'T FEE
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
CLAMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
Total (37 CFR 1.18(b))	Minus **	=	X =		X =	
Independent (37 CFR 1.18(c))	Minus ***	=	X =		X =	
Application Size Fee (37 CFR 1.18(h))						
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.18(j))						
			TOTAL	ADD'T FEE	TOTAL	ADD'T FEE

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to be (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM			
First Named Inventor/Applicant Name:	John Douglas Steinberg			
Filer:	David P. Emery/Gabriel Goodin			
Attorney Docket Number:	024115			
Filed as Large Entity				
Filing Fees for ex parte reexam				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
EX PARTE REEXAMINATION (1.510(A)) NON-STREAMLINED	1812	1	12600	12600
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				12600

Electronic Acknowledgement Receipt

EFS ID:	41919338
Application Number:	90014679
International Application Number:	
Confirmation Number:	6590
Title of Invention:	SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM
First Named Inventor/Applicant Name:	John Douglas Steinberg
Customer Number:	23373
Filer:	David P. Emery/Gabriel Goodin
Filer Authorized By:	David P. Emery
Attorney Docket Number:	024115
Receipt Date:	12-FEB-2021
Filing Date:	
Time Stamp:	21:31:27
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$12600
RAM confirmation Number	E20212BL35261653
Deposit Account	194880
Authorized User	Gabriel Goodin

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Receipt of Orig. Ex Parte Request by Third Party	99991221ReexamTransmittalas filed.pdf	203256	no	4
			fd6fdm2051e6d76a9c8712cd11c0dd6426c0f1ec		
Warnings:					
Information:					
2	Receipt of Orig. Ex Parte Request by Third Party	99991221RequestforReexaminationasfiled.pdf	5405971	no	138
			129c0711c597035c0f9c290ac02c0141121f36d2		
Warnings:					
Information:					
3	Reexam Certificate of Service	99991221CertificateofServiceas filed.pdf	111050	no	1
			3a86c9c5a6c6f6cc0f5c4cac60c382a5c79dcdd6c4		
Warnings:					
Information:					
4	Copy of patent for which reexamination is requested	99991221ExAUS10534382asfiled.pdf	4253635	no	18
			6c15cd621f97dc0a22928cd11c713c1c1275d9		
Warnings:					
Information:					
5	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExC20090302994Reheasfiled.pdf	5850708	no	25
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Warnings:					
Information:					
6	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExDUS8020777asfiled.pdf	7880421	no	38
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Warnings:					
Information:					

7	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExEUS8239922asfiled.pdf	19938982 e2c0f4c41600a9ca8c7a0c6a8d55c1a93733c6	no	94
Warnings:					
Information:					
8	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExFCIamConstructio nasfiled.pdf	190358 913a98c476caac22c651ff60c15dc5a1a278d30	no	4
Warnings:					
Information:					
9	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExGRosingDeclaratio nasfiled.pdf	1304325 58e972d4d42785a6d95c2d83cc13ca47c2d00	no	114
Warnings:					
Information:					
10	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExKFH61134714asfile d.pdf	5733542 03116A62a0792d4dc99d084c25d9cd9c05c346f	no	33
Warnings:					
Information:					
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Warnings:					
Information:					
12	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExB382FileHistoryasfil ed.pdf	13603463 84d793c2a2c968c7c3a758c5cc20d3522122a313	no	272
Warnings:					
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Information:					
13	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExHFH15002791asfile d.pdf	23812761 36a301c598263673c90c940c679c31nd3440c83a	no	479
Warnings:					
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Image File Wrapper and may affect subsequent processing

Information:

14	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExIFH13470074asfile d.pdf	23591159	no	437
			7ca6f6c111439834722a726673da66510fe7 006a		

Warnings:

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Information:

15	Reexam - Affidavit/Decl/Exhibit Filed by 3rd Party	99991221ExJFH12502064asfile d.pdf	15293058	no	282
			4c191099a1de7350413393771a530a2ae976d c9e5		

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

16	Fee Worksheet (SB06)	fee-info.pdf	30345	no	2
			891a1a21fa0c4695ee9a103c4b4e08a521c9 412		

Warnings:**Information:**

Total Files Size (in bytes):	128050847
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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Bib Data Sheet

CONFIRMATION NO. 6590

SERIAL NUMBER 90/014,679	FILING OR 371(c) DATE 02/12/2021 RULE	CLASS 700	GROUP ART UNIT 3992	ATTORNEY DOCKET NO. 024115
AIA (First Inventor to File): YES				
INVENTORS 10534382, Residence Not Provided; ECOFACTOR INC., REDWOOD CITY, CA; DAVID P. EMERY (3RD PTY REQ.), WASHINGTON, DC;				
APPLICANTS SUGHRUE MION, PLLC, WASHINGTON, DC				
** CONTINUING DATA ***** This application is a REX of 16/374,085 04/03/2019 PAT 10534382 which is a CON of 15/002,791 01/21/2016 PAT 10289131 which is a CON of 13/470,074 05/11/2012 PAT 9244470 which is a CON of 12/502,064 07/13/2009 PAT 8180492 which claims benefit of 61/134,714 07/14/2008				
** FOREIGN APPLICATIONS *****				
Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no 35 USC 119 (a-d) conditions <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after met Allowance Verified and Acknowledged		STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS 20
ADDRESS 20995		INDEPENDENT CLAIMS 2		
TITLE SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM				
FILING FEE	FEES: Authority has been given in Paper		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of	

RECEIVED 12600	No. _____ to charge/credit DEPOSIT ACCOUNT	(time)
	No. _____ for following:	<input type="checkbox"/> 1.18 Fees (Issue)
		<input type="checkbox"/> Other _____
		<input type="checkbox"/> Credit

Patent Assignment Abstract of Title

Total Assignments: 3
Application #: 12502264

Filing Dt: 07/13/2009

Patent #: 8180422

Issue Dt: 05/15/2012

PCT #: NONE

Intl Reg #:

Publication #: US20100280647

Pub Dt: 11/04/2010

Inventor: John Douglas Steinberg

Title: SYSTEM AND METHOD FOR USING A NETWORKED ELECTRONIC DEVICE AS AN OCCUPANCY SENSOR FOR AN ENERGY MANAGEMENT SYSTEM

Assignment: 1
Reel/Frame: 025711/0975

Received: 01/25/2011

Recorded: 01/25/2011

Mailed: 02/04/2011

Pages: 3

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Assignor: STEINBERG, JOHN DOUGLAS

Exec Dt: 01/21/2011

Assignee: ECOFACOR, INC.

423 BROADWAY, #801

MILLBRAE, CALIFORNIA 94030

Correspondent: KNOBBE MARTENS OLSON & BEAR LLP

2040 MAIN STREET

FOURTEENTH FLOOR

IRVINE CA 92614

Assignment: 2
Reel/Frame: 028389/0621

Received: 06/11/2012

Recorded: 06/11/2012

Mailed: 06/19/2012

Pages: 9

Conveyance: SECURITY AGREEMENT

Assignor: ECOFACOR, INC.

Exec Dt: 06/07/2012

Assignee: SILICON VALLEY BANK

3003 TASMAN DR

SANTA CLARA, CALIFORNIA USA 95054

Correspondent: UCC DIRECT SERVICES

ATTN: 14080632

187 WOLF ROAD, SUITE 101

ALBANY, NY 12205

Assignment: 3
Reel/Frame: 031825/0231

Received: 11/01/2013

Recorded: 11/01/2013

Mailed: 11/20/2013

Pages: 2

Conveyance: RELEASE

Assignor: SILICON VALLEY BANK

Exec Dt: 10/30/2013

Assignee: ECOFACOR, INC.

720 BAY ROAD, SUITE 201

REDWOOD CITY, CALIFORNIA 94063

Correspondent: UCC DIRECT

ATTN: 14080632

187 WOLF ROAD, SUITE 101

ALBANY, NY 12205

Search Results as of 02/16/2021 10:52 AM



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REEXAM CONTROL NUMBER	FILING OR 371(c) DATE	PATENT NUMBER
90/014,679	02/12/2021	10534382

SUGHRUE MION, PLLC
 2000 PENNSYLVANIA AVENUE, NW
 SUITE 900
 WASHINGTON, DC 20006

CONFIRMATION NO. 6590
REEXAMINATION REQUEST
NOTICE



Date Mailed: 02/19/2021

NOTICE OF REEXAMINATION REQUEST FILING DATE

(Third Party Requester)

Requester is hereby notified that the filing date of the request for reexamination is 02/12/2021, the date that the filing requirements of 37 CFR § 1.510 were received.

A decision on the request for reexamination will be mailed within three months from the filing date of the request for reexamination. (See 37 CFR 1.515(a)).

A copy of the Notice is being sent to the person identified by the requester as the patent owner. Further patent owner correspondence will be the latest attorney or agent of record in the patent file. (See 37 CFR 1.33). Any paper filed should include a reference to the present request for reexamination (by Reexamination Control Number).

cc: Patent Owner
 20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

/rbell/

Legal Instruments Examiner
 Central Reexamination Unit 571-272-7705; FAX No. 571-273-9900



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REEXAM CONTROL NUMBER	FILING OR 371(c) DATE	PATENT NUMBER
90/014,679	02/12/2021	10534382

CONFIRMATION NO. 6590

REEXAM ASSIGNMENT NOTICE



20995
 KNOBBE MARTENS OLSON & BEAR LLP
 2040 MAIN STREET
 FOURTEENTH FLOOR
 IRVINE, CA 92614

Date Mailed: 02/19/2021

NOTICE OF ASSIGNMENT OF REEXAMINATION REQUEST

The above-identified request for reexamination has been assigned to Art Unit 3992. All future correspondence to the proceeding should be identified by the control number listed above and directed to the assigned Art Unit.

A copy of this Notice is being sent to the latest attorney or agent of record in the patent file or to all owners of record. (See 37 CFR 1.33(c)). If the addressee is not, or does not represent, the current owner, he or she is required to forward all communications regarding this proceeding to the current owner(s). An attorney or agent receiving this communication who does not represent the current owner(s) may wish to seek to withdraw pursuant to 37 CFR 1.36 in order to avoid receiving future communications. If the address of the current owner(s) is unknown, this communication should be returned within the request to withdraw pursuant to Section 1.36.

NOTICE OF USPTO EX PARTE REEXAMINATION PATENT OWNER STATEMENT WAIVER PROGRAM

The USPTO has implemented a pilot program where, after a reexamination proceeding has been granted a filing date and before the examiner begins his or her review, the patent owner may orally waive the right to file a patent owner's statement. See *"Pilot Program for Waiver of Patent Owner's Statement in Ex Parte Reexamination Proceedings,"* 75 FR 47269 (August 5, 2010). One goal of the pilot program is to reduce the pendency of reexamination proceedings and improve the efficiency of the reexamination process.

Ordinarily when ex parte reexamination is ordered, the USPTO must wait until after the receipt of the patent owner's statement and the third party requester's reply, or after the expiration of the time period for filing the statement and reply (a period that can be as long as 5 to 6 months), before mailing a first determination of patentability. The USPTO's first determination of patentability is usually a first Office action on the merits or a Notice of Intent to Issue Reexamination Certificate (NIRC).

Under the pilot program, the patent owner's oral waiver allows the USPTO to act on the first determination of patentability immediately after determining that reexamination will be ordered, and in a suitable case issue the reexamination order and the first determination of patentability (which could be a NIRC if the claims under reexamination are confirmed) at the same time.

Benefits to the Patent Owner for participating in this pilot program include reduction in pendency.

To participate in this pilot program, Patent Owners may contact the USPTO's Central Reexamination Unit (CRU) at 571-272-7705. The USPTO will make the oral waiver of record in the reexamination file in an interview summary and a copy will be mailed to the patent owner and any third party requester.

cc: Third Party Requester(if any)
 SUGHRUE MION, PLLC
 2000 PENNSYLVANIA AVENUE, NW
 SUITE 900
 WASHINGTON, DC 20006

/rbell/

Legal Instruments Examiner
 Central Reexamination Unit 571-272-7705; FAX No. 571-273-9900

Litigation Search Report CRU 3999

Reexamination Control No. 90/014,679

To:	HUGHES, Deandra	From:	GRAVES, Monica A.
Location:	OCRU	Location:	OCRU
Art Unit:	3992	Phone:	2-7253
Date:	<u>01 March 2021</u>	E-mail:	monica.graves@uspto.gov

Search Notes

U.S. PATENT NO: 10,534,382

1. Performed a KeyCite Search in Westlaw, which retrieves all history on the patent including any litigation.
2. Performed a search on the patent in Lexis CourtLink for any open dockets or closed cases.
3. Performed a search in Lexis in the Federal Courts and Administrative Materials databases for any cases found.
4. Performed a search in Lexis in the IP Journal and Periodicals database for any articles on the patent.
5. Performed a search in Lexis in the news databases for any articles about the patent or any articles about litigation on this patent.

LexisNexis

10504382

U.S. Publications, USPTO Patent Decisions: BPAI and PTAB, Intellectual
Property: Merit's Legislation: Reissue

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History

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Reissue for 10504382 1 result

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1

USPTO Patent Decisions: BPAI and PTAB

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Administrative Materials (0)

No documents found in USPTO Patent Decisions: BPAI and PTAB.

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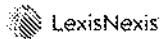
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User Name: MONICAGRAVES

Date and Time: Monday, March 1, 2021 7:21:00 PM EST

Job Number: 137799298

Results List (includes up to 250)

1. Results list for: Stay and patent-number(10534382)

Client/Matter: -None-

Terms: Stay and patent-number(10534382)

Search Type: Terms and Connectors

Narrowed by:

Content Type
Dockets

Narrowed by
Case Status: Open,Unknown,Closed; Court: U.S. Circuit Court of Appeals (United States),United States U.S. District Courts (Civil),U.S. Supreme Court,U.S. Patent Trial and Appeals Board; > U.S. Circuit Court of Appeals (United States),United States U.S. District Courts (Civil),U.S. Supreme Court,U.S. Patent Trial and Appeals Board

Results for: **Stay and patent-number(10534382)****Dockets**1. Ecofactor, Inc. V. Alarm.Com Incorporated Et Al

... District Judge Leo T. Sorokin: ELECTRONIC ORDER entered.The 18 Motion to **Stay** is ALLOWED IN PART. This matter is **STAYED** for three months. On January 15, 2021, the parties shall file ...

... or separate positions as to whether the Court should continue the **stay** . This report shall include an update on the status of ...

... revisit the consolidation question, upon request, when the Court lifts the **stay**. (Montes, Mariliz) (Entered: 10/27/2020) 5949244431 2021-01-06 District Judge Leo T. Sorokin: ELECTRONIC ORDER entered.The 18 Motion to **Stay** is ALLOWED IN PART. This matter is **STAYED** for three months. On January 15, 2021, the parties shall file ...

... or separate positions as to whether the Court should continue the **stay** . This report shall include an update on the status of ...

... revisit the consolidation question, upon request, when the Court lifts the **stay**. (Montes, Mariliz) (Entered: 10/27/2020)...

... of the parties' status report, Doc. No. 30, this matter is **STAYED** for a further four months from this date. On May 12, ...

... or separate positions as to whether the Court should continue the **stay** . This report shall include an update on the status of ...

Court: United States District Court, Massachusetts | **Date Filed:** May 26, 2020 | **Docket Number:** 1:20cv11007 | **Nature of Suit:** Patent | **Cause:** Patent Infringement | **Status:** Open

2. Ecofactor, Inc. V. Google Llc

... thermostats as tool to verify peak demand reduction 2014-05-27 702 182 **10,534,382** System and method for using a wireless device as a sensor ...

... to Motion, filed by EcoFactor, Inc., re 41 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Google LLC (Chung, C.) (Entered: ...

... Waiver of Reply by Google LLC re 41 Opposed MOTION to **Stay** Case Pending Transfer (Jones, Michael) (Entered: 12/02/2020) 5992022574 2021-02-09 NOTICE of ...

... Waiver of Reply by Google LLC re 41 Opposed MOTION to **Stay** Case Pending Transfer (Jones, Michael) (Entered: 12/02/2020)...

... Google LLC (Jones, Michael) (Entered: 11/17/2020) 41 2020-11-24 Opposed MOTION to **Stay** Case Pending Transfer by Google LLC. (Attachments: # 1 Proposed Order ...

... to Motion, filed by EcoFactor, Inc., re 41 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Google LLC (Chung, C.) (Entered: ...

... to Motion, filed by EcoFactor, Inc., re 41 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Google LLC (Chung, C.) (Entered: ...

Court: United States District Court, Texas Western | **Date Filed:** Jan 31, 2020 | **Docket Number:** 6:20cv75 | **Nature of Suit:** Patent | **Cause:** Patent Infringement | **Status:** Open

3. Ecofactor, Inc. V. Ecobee, Inc.

... to Motion, filed by EcoFactor, Inc., re 39 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Ecobee, Inc. (Chung, C.) (Entered: ...

... Waiver of Reply by Ecobee, Inc. re 39 Opposed MOTION to **Stay** Case Pending Transfer (Ainsworth, Jennifer) (Entered: 12/02/2020) 5891060721 Events since last ...
 ... Waiver of Reply by Ecobee, Inc. re 39 Opposed MOTION to **Stay** Case Pending Transfer (Ainsworth, Jennifer) (Entered: 12/02/2020)...
 ... Ecobee, Inc. (Ainsworth, Jennifer) (Entered: 11/17/2020) 39 2020-11-24 Opposed MOTION to **Stay** Case Pending Transfer by Ecobee, Inc.. (Attachments: # 1 Proposed Order)(Ainsworth, ...
 ... to Motion, filed by EcoFactor, Inc., re 39 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Ecobee, Inc. (Chung, C.) (Entered: ...
 ... to Motion, filed by EcoFactor, Inc., re 39 Opposed MOTION to **Stay** Case Pending Transfer filed by Defendant Ecobee, Inc. (Chung, C.) (Entered: ...
 ... thermostats as tool to verify peak demand reduction 2014-05-27 702 182 10,534,382 System and method for using a wireless device as a sensor ...

Court: United States District Court, Texas Western | **Date Filed:** Jan 31, 2020 | **Docket Number:** 6:20cv78
 | **Nature of Suit:** Patent | **Cause:** Patent Infringement | **Status:** Open

4. Ecofactor, Inc. V. Vivint, Inc.

... re 39 Notice (Other) Notice of Joinder to Defendants' Motion to **Stay** by Vivint, Inc.. (Attachments: # 1 Proposed Order)(Williams, Fred) (Entered: 02/09/2021) ...
 ... NOTICE of Joinder by Defendant Vivint, Inc. to the Motion to **Stay** Filed By Google LLC and ecobee, Inc. in Related Actions by ...
 ... NOTICE of Joinder by Defendant Vivint, Inc. to the Motion to **Stay** Filed By Google LLC and ecobee, Inc. in Related Actions by ...
 ... Notice Of Filing Of Plaintiff EcoFactor's Opposition To Defendants Motion To **Stay** Pending Defendants Transfer Motions by EcoFactor, Inc. re 39 Notice (Other) ...
 ... thermostats as tool to verify peak demand reduction 2014-05-27 702 182 10,534,382 System and method for using a wireless device as a sensor ...

Court: United States District Court, Texas Western | **Date Filed:** Jan 31, 2020 | **Docket Number:** 6:20cv80
 | **Nature of Suit:** Patent | **Cause:** Patent Infringement | **Status:** Open

CourtLink®

Document: 1:20cv11007, Ecofactor, Inc. V. Alarm.Com Incorporated Et Al

1:20cv11007, Ecofactor, Inc. V. Alarm.Com Incorporated Et Al

US District Court Docket

United States District Court, Massachusetts

(Boston)

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This case was retrieved on 01/06/2021

Header

Case Number: 1:20cv11007

Class Code: Open

Date Filed: 05/26/2020

Statute: 15:1126

Assigned To: District Judge Leo T. Sorokin

Jury Demand: Plaintiff

Nature of Suit: Patent (830)

Demand Amount: \$0

Cause: Patent Infringement

NOS Description: Patent

Lead Docket: None

Other Docket: 1:19cv12323

Jurisdiction: Federal Question

Litigants

Attorneys

EcoFactor, Inc.

C. Jay Chung

Plaintiff

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

RUSS AUGUST & KABAT

12424 Wilshire Boulevard, 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email:Jchung@raklaw.Com

Litigants

Attorneys

Jacob R. Buczko

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

3108267474 Fax: 310-826-6991

Email:Jbuczko@raklaw.Com

Marc A. Fenster

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

124244 Wilshire Boulevard

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Mafenster@raklaw.Com

Paul A. Kroeger

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Boulevard 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Email:Pkroeger@raklaw.Com

Reza Mirzale

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

RUSS AUGUST & KABAT

12424 Wilshire Boulevard, 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email:Rsmirzale@raklaw.Com

Litigants

(320) 620-7777 Email: info@birnbaumgodkin.com
Attorneys

David S. Godkin

ATTORNEY TO BE NOTICED

Birnbaum & Godkin, LLP

280 Summer Street

Boston, MA 02210

USA

617-307-6100 Fax: 617-307-6101

Email: Godkin@birnbaumgodkin.Com

James E. Kruzer

ATTORNEY TO BE NOTICED

Birnbaum & Godkin, LLP

280 Summer Street, 5th Floor

Boston, MA 02210

USA

617-307-6100 Fax: 617-307-6101

Email: Kruzer@birnbaumgodkin.Com

Alarm.com Incorporated

Emma K. Kolesar

Defendant

LEAD ATTORNEY; PRO HAC VICE; ATTORNEY TO BE
NOTICED

Cravath, Swaine & Moore, LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1749 Fax: (212) 474-3700

Email: Ekolesar@cravath.Com

Jonathan O. Stahl

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019

USA

212-474-1710 Email: Jstahl@cravath.Com

Marc J. Khadpe

PRO HAC VICE; ATTORNEY TO BE NOTICED

Litigants

PRO HAC VICE; ATTORNEY TO BE NOTICED
Attorneys
Cravath, Swaine & Moore LLP

Worldwide Place 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1382 Fax: (212) 474-3700

Email: Mkhadpe@cravath.Com

Matthew J. Boggess

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1749 Fax: (212) 474-3700

Email: Mboggess@cravath.Com

Richard J. Stark

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

325 Eighth Ave. Worldwide Plaza

New York, NY 10019

USA

212-474-1000 Fax: 212-474-3700

Email: Rstark@cravath.Com

Alarm.com Holdings Inc.

Defendant

Emma K. Kolesar

LEAD ATTORNEY; PRO HAC VICE; ATTORNEY TO BE
NOTICED

Cravath, Swaine & Moore, LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1749 Fax: (212) 474-3700

Email: Ekolesar@cravath.Com

Anita M.C. Spieth

ATTORNEY TO BE NOTICED

Choate, Hall & Stewart

Two International Place 100 150 Oliver Street

Litigants

TWO INTERNATIONAL PLACE 100 FIDELITY DRIVE, SUITE 200
Attorneys
Boston, MA 02110

USA

617-248-4031 Email: Aspleth@choate.Com

Jonathan D. Stahl

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019

USA

212-474-1710 Email: Jstahl@cravath.Com

Marc J. Khadpe

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

Worldwide Place 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1382 Fax: (212) 474-3700

Email: Mkhadpe@cravath.Com

Matthew J. Boggess

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

Worldwide Plaza 825 Eighth Avenue

New York, NY 10019-7475

USA

(212) 474-1749 Fax: (212) 474-3700

Email: Mboggess@cravath.Com

Richard J. Stark

PRO HAC VICE; ATTORNEY TO BE NOTICED

Cravath, Swaine & Moore LLP

825 Eighth Ave. Worldwide Plaza

New York, NY 10019

USA

212-474-1000 Fax: 212-474-3700

Email: Rstark@cravath.Com

Proceedings

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<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Free	1	05/26/2020	COMPLAINT against All Defendants Filing fee: \$ 400, receipt number 0101-8257331 (Fee Status: Filing Fee paid), filed by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Civil Cover Sheet, # 6 Capacity Form) (Kruzer, James) (Entered: 05/26/2020)	
<input type="checkbox"/>	Online	2	05/26/2020	REPORT ON THE FILING OF AN ACTION REGARDING PATENT OR TRADEMARK. (Kruzer, James) (Entered: 05/26/2020)	
<input type="checkbox"/>	Online	3	05/26/2020	CORPORATE DISCLOSURE STATEMENT by EcoFactor, Inc.. (Kruzer, James) (Entered: 05/26/2020)	
<input type="checkbox"/>	Runner		05/27/2020	ELECTRONIC NOTICE of Duplicate Filing Fee and Credit for Refund, for \$400.00 paid on 05/26/2020, receipt number 0101-8257302. (Tran, Henry) (Entered: 05/27/2020)	
<input type="checkbox"/>	Runner	4	05/27/2020	ELECTRONIC NOTICE of Case Assignment. District Judge Leo T. Sorokin assigned to case. If the trial Judge issues an Order of Reference of any matter in this case to a Magistrate Judge, the matter will be transmitted to Magistrate Judge Jennifer C. Boal. (Daniel, Chris) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	5	05/27/2020	Summons Issued as to Alarm.com Holdings Inc., Alarm.com Incorporated. Counsel receiving this notice electronically should download this summons, complete one for each defendant and serve it in accordance with Fed.R.Civ.P. 4 and LR 4.1. Summons will be mailed to plaintiff(s) not receiving notice electronically for completion of service. (Jones, Sherry) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	6	05/27/2020	NOTICE of Appearance by David S. Godkin on behalf of EcoFactor, Inc. (Godkin, David) (Entered: 05/27/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	7	06/02/2020	Assented to MOTION for Leave to Appear Pro Hac Vice for admission of Reza Mirzaie, Marc A. Fenster, Paul Kroeger, C Jay Chung, Jacob R. Buczko Filing fee: \$ 500, receipt number 0101-8267064 by EcoFactor, Inc.. (Attachments: # 1 Mirzaie Certificate, # 2 Fenster Certificate, # 3 Kroeger Certificate, # 4 Chung Certificate, # 5 Buczko Certificate)(Kroeger, James) (Entered: 06/02/2020)	
<input type="checkbox"/>	Former	8	06/03/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered granting 7 Motion for Leave to Appear Pro Hac Vice Added Reza Mirzaie, Marc A. Fenster, Paul A. Kroeger, C. Jay Chung, and Jacob R. Buczko. Attorneys admitted Pro Hac Vice must register for electronic filing if the attorney does not already have an ECF account in this district. To register go to the Court website at www.mad.uscourts.gov. Select Case Information, then Electronic Filing (CM/ECF) and go to the CM/ECF Registration Form. (Montes, Mariliz) (Entered: 06/03/2020)	
<input type="checkbox"/>	Former	9	06/24/2020	Set Deadlines: Proof of Service due by 8/28/2020. (Simeone, Maria) (Entered: 06/24/2020)	
<input type="checkbox"/>	Online	10	08/24/2020	SUMMONS Returned Executed Alarm.com Holdings Inc. served on 8/19/2020, answer due 9/9/2020. (Chung, C.) (Entered: 08/24/2020)	
<input type="checkbox"/>	Online	11	08/24/2020	SUMMONS Returned Executed Alarm.com Incorporated served on 8/19/2020, answer due 9/9/2020. (Chung, C.) (Entered: 08/24/2020)	
<input type="checkbox"/>	Online	12	09/03/2020	NOTICE of Appearance by Anita M.C. Spieth on behalf of Alarm.com Holdings Inc.. (Spieth, Anita) (Entered: 09/03/2020)	
<input type="checkbox"/>	Online	13	09/03/2020	Joint MOTION for Extension of Time to October 26, 2020 to File Answer or Otherwise Respond by Alarm.com Holdings Inc..(Spieth, Anita) (Entered: 09/03/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner	14	09/04/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered granting 13 Motion for Extension of Time to Answer. Alarm.com Holdings Inc. answer due 10/26/2020. (Baker, Casey) (Entered: 09/04/2020)	
<input type="checkbox"/>	Online	15	09/08/2020	MOTION for Leave to Appear Pro Hac Vice for admission of Richard J. Stark, Marc J. Khadpe, Matthew J. Boggess, Emma K. Kolesar, and Jonathan D. Stahl by Alarm.com Holdings Inc.. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E)(DaSilva, Carolina) (Entered: 09/08/2020)	
<input type="checkbox"/>	Runner	16	09/08/2020	Payment: \$ 500, receipt number 0101-8406673 for 15 MOTION for Leave to Appear Pro Hac Vice for admission of Richard J. Stark, Marc J. Khadpe, Matthew J. Boggess, Emma K. Kolesar, and Jonathan D. Stahl (DaSilva, Carolina) (Entered: 09/08/2020)	
<input type="checkbox"/>	Runner	17	09/08/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered: ALLOWING 15 Motion for Leave to Appear Pro Hac Vice Added Richard J. Stark, Marc J. Khadpe, Matthew J. Boggess, Emma K. Kolesar, Jonathan D. Stahl. Attorneys admitted Pro Hac Vice must register for electronic filing if the attorney does not already have an ECF account in this district. To register go to the Court website at www.mad.uscourts.gov . Select Case Information, then Electronic Filing (CM/ECF) and go to the CM/ECF Registration Form. (Vieira, Leonardo) (Entered: 09/08/2020)	
<input type="checkbox"/>	Online	18	09/14/2020	MOTION to Stay and Consolidate by Alarm.com Holdings Inc..(Spieth, Anita) (Entered: 09/14/2020)	
<input type="checkbox"/>	Free	19	09/14/2020	MEMORANDUM in Support re 18 MOTION to Stay and Consolidate filed by Alarm.com Holdings Inc.. (Spieth, Anita) (Entered: 09/14/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	20	09/14/2020	DECLARATION re 19 Memorandum in Support of Motion of Mark Khadpe by Alarm.com Holdings Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Exhibit 5, # 6 Exhibit 6, # 7 Exhibit 7, # 8 Exhibit 8)(Spieth, Anita) (Entered: 09/14/2020)	
<input type="checkbox"/>	Online	21	09/28/2020	Opposition re 18 MOTION to Stay and Consolidate filed by EcoFactor, Inc.. (Chung, C.) (Entered: 09/28/2020)	
<input type="checkbox"/>	Online	22	10/05/2020	MOTION for Leave to File Reply Brief re Motion to Stay & Consolidate by Alarm.com Holdings Inc.. (Attachments: # 1 Exhibit A)(Spieth, Anita) (Entered: 10/05/2020)	
<input type="checkbox"/>	Runner	23	10/06/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered granting 22 Defendant, Alarm. Com Holding's Motion for Leave to File Reply Brief to 22 Plaintiff's Opposition to 18 Motion to Stay and Consolidate; Counsel using the Electronic Case Filing System should now file the document for which leave to file has been granted in accordance with the CM/ECF Administrative Procedures. Counsel must include - Leave to file granted on (date of order)- in the caption of the document. (Montes, Mariliz) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	24	10/06/2020	REPLY to Response to 18 MOTION to Stay and Consolidate filed by Alarm.com Holdings Inc.. (Spieth, Anita) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	25	10/21/2020	Joint MOTION for Extension of Time to December 16, 2020 to Respond to Complaint by Alarm.com Holdings Inc..(Spieth, Anita) (Entered: 10/21/2020)	
<input type="checkbox"/>	Runner	26	10/21/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered granting 25 Joint Motion for Extension of Deadlines. Defendants' Answer to complaint is due by 12/16/2020; plaintiff's opposition to Defendants' motion to dismiss is due by 1/13/2021. (Montes,	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner	27	10/21/2020	Reset Deadlines: Motion to dismiss due by 12/16/2020 opposition due by 1/13/2021. (Montes, Mariliz) (Entered: 10/21/2020)	
<input type="checkbox"/>	Runner	28	10/27/2020	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered.The 18 Motion to Stay is ALLOWED IN PART. This matter is STAYED for three months. On January 15, 2021, the parties shall file a joint status report setting forth their joint or separate positions as to whether the Court should continue the stay . This report shall include an update on the status of the ITC proceedings. The request to consolidate is DENIED AS MOOT at this time. The Court will revisit the consolidation question, upon request, when the Court lifts the stay . (Montes, Mariliz) (Entered: 10/27/2020)	
<input type="checkbox"/>	Runner	29	10/27/2020	Set Deadlines: Status Report due by 1/15/2021; Case stayed until 1/25/2021. (Montes, Mariliz) (Entered: 10/27/2020)	
<input type="checkbox"/>	Online	30	01/15/2021	STATUS REPORT JOINT by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4)(Kruzer, James) (Entered: 01/15/2021)	Events since last full update
<input type="checkbox"/>	Runner	31	01/19/2021	District Judge Leo T. Sorokin: ELECTRONIC ORDER entered. After consideration of the parties' status report, Doc. No. 30, this matter is STAYED for a further four months from this date. On May 12, 2021, the parties shall file a joint status report setting forth their joint or separate positions as to whether the Court should continue the stay . This report shall include an update on the status of the ITC proceedings.(Montes, Mariliz) (Entered: 01/19/2021)	Events since last full update
<input type="checkbox"/>	Runner	32	01/19/2021	Set Deadlines: Status Report due by 5/12/2021. (Montes, Mariliz) (Entered: 01/19/2021)	Events since last full update

Patents

Number	Title	Issued	Class	Subclass
US,180,492	System and method for using a networked electronic device as an occupancy sensor for an energy management system	05/15/2012	700	276
US,412,488	System and method for using a network of thermostats as tool to verify peak demand reduction	04/02/2013	702	182
US,738,327	System and method for using a network of thermostats as tool to verify peak demand reduction	05/27/2014	702	182
US,10,534,382	System and method for using a wireless device as a sensor for an energy management system	01/14/2020	1	1

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Content Type: Dockets

Terms: Stay and patent-number(10534382)

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US District Court Docket

United States District Court, Texas Western

(Waco)

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Header

Case Number: 6:20cv75

Class Code: Open

Date Filed: 01/31/2020

Statute: 35:271

Assigned To: Judge Alan D Albright

Jury Demand: Both

Nature of Suit: Patent (830)

Demand Amount: \$0

Cause: Patent Infringement

NOS Description: Patent

Lead Docket: None

Other Docket: None

Jurisdiction: Federal Question

Litigants

EcoFactor, Inc.

Plaintiff

Attorneys

Brian W. Lewis

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Email:bilewis@raklaw.Com

Litigants

Attorneys

C. Jay Chung

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email: Jchung@raklaw.Com

James N. Pickens

LEAD ATTORNEY; PRO HAC VICE; ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email: Jpickens@raklaw.Com

Marc A. Fenster

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email: Mafenster@raklaw.Com

Paul A. Kroeger

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email: Pkroeger@raklaw.Com

Christopher D. Pauls

Litigants

Christopher A. Davis

Attorneys

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Kdavis@raklaw.Com

Reza Mirzaie

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Rmirzaie@raklaw.Com

Google LLC

Bijal V. Vakil

Defendant

LEAD ATTORNEY;ATTORNEY TO BE NOTICED

White & Case LLP

3000 El Camino Real 2 Palo Alto Square, Ste. 900

Palo Alto, CA 94306

USA

650-213-0303 Fax: 650-213-8158

Email:Bvakil@whitecase.Com

Eric Lancaster

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

White & Case LLP

3000 El Camino Real, 2 Palo Alto Square, Suite 900

Palo Alto, CA 94306

USA

650-213-0300 Fax: 650-213-8158

Email:Eric.Lancaster@whitecase.Com

Henry Huang

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Litigants

NOTICED
Attorneys
White & Case LLP

3000 El Camino Real, 2 Palo Alto Square, Suite 900

Palo Alto, CA 94306

USA

(650) 213-0300 Fax: (650) 213-8158

Email: Henry.Huang@whitecase.Com

Michael E. Jones

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Potter Minton PC

110 N College Suite 500

Tyler, TX 75702

USA

903-597-8311 Fax: 903-593-0846

Email: Mikejones@potterminton.Com

Michael J. Songer

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

White & Case LLP

701 Thirteenth Street

Washington, DC 20005-3807

USA

202-626-3647 Fax: 202-639-9355

Email: Michael.Songer@whitecase.Com

Shamita D. Etienne-Cummings

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

White & Case LLP

701 13th Street Nw

Washington, DC 20005

USA

202-626-3695 Fax: 202-639-9355

Email: Setienne@whitecase.Com

Proceedings

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<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Free	1	01/31/2020	COMPLAINT (Filing fee \$ 400 receipt number 9542-13152920), filed by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Civil Cover Sheet)(Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online	2	01/31/2020	RULE 7 DISCLOSURE STATEMENT filed by EcoFactor, Inc.. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online	3	01/31/2020	NOTICE of AO 120 Patent Report Form by EcoFactor, Inc. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online	4	01/31/2020	REQUEST FOR ISSUANCE OF SUMMONS by EcoFactor, Inc.. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Runner		01/31/2020	Case assigned to Judge Alan D Albright. CM WILL NOW REFLECT THE JUDGE INITIALS AS PART OF THE CASE NUMBER. PLEASE APPEND THESE JUDGE INITIALS TO THE CASE NUMBER ON EACH DOCUMENT THAT YOU FILE IN THIS CASE. (bw) (Entered: 02/03/2020)	
<input type="checkbox"/>	Online	7	01/31/2020	Summons Issued as to Google LLC. (bw) (Entered: 02/03/2020)	
<input type="checkbox"/>	Online	5	02/03/2020	Pursuant to the Standing Order Regarding Patent Trademark Cases effective 12/9/19, Attorneys filing Patent/Trademark cases in TXWD Waco division must prepare the attached form AO120 and e-file upon opening of the case using the event NOTICE OF FILING OF PATENT/TRADEMARK FORM. (Attachments: # 1 Blank AO120) (bw) (Entered: 02/03/2020)	
<input type="checkbox"/>	Online	6	02/03/2020	Notice of Filing of Patent/Trademark Form (AO 120). AO 120 forwarded to the Director of the U.S. Patent and Trademark Office. (Mirzaie, Reza) (Entered: 02/03/2020)	
<input type="checkbox"/>	Free	8	03/03/2020	Unopposed MOTION for Extension of Time to File Answer re 1 Complaint by Google LLC. (Attachments: # 1 Proposed Order of Extension, Michael)	

<input type="checkbox"/>	Availability	#	Date	(Attachments: # 1 Proposed Order)(Jones, Michael) Proceeding Text (Entered: 03/03/2020)	Source
<input type="checkbox"/>	Online	9	03/04/2020	Amended MOTION for Extension of Time to File Answer re 1 Complaint by Google LLC. (Attachments: # 1 Proposed Order)(Jones, Michael) (Entered: 03/04/2020)	
<input type="checkbox"/>	Runner		03/04/2020	Text Order GRANTING 9 Motion for Extension of Time to Answer entered by Judge Alan D Albright. Before the Court is Defendant's Unopposed Amended Motion to Extend Time to Move, Answer, or Otherwise Respond to First Amended Complaint. The Court GRANTS the motion. It is therefore ORDERED that Defendant shall have until and through April 6, 2020 to answer, plead, move, or otherwise respond, in any manner whatsoever, included but not limited to Rule 12 motion(s), to Plaintiff's Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 03/04/2020)	
<input type="checkbox"/>	Runner		03/04/2020	Text Order MOOTING 8 Motion for Extension of Time to Answer entered by Judge Alan D Albright. In light of the filing of ECF No. 9, the Court MOOTS this motion. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 03/04/2020)	
<input type="checkbox"/>	Runner		03/04/2020	Reset Answer Deadlines: Google LLC answer due 4/6/2020. (bw) (Entered: 03/04/2020)	
<input type="checkbox"/>	Online	10	03/24/2020	STANDING ORDER from U.S. District Judge Alan D. Albright regarding scheduled civil hearings. (lada) (Entered: 03/25/2020)	
<input type="checkbox"/>	Online	11	03/27/2020	MOTION to Appear Pro Hac Vice by Michael E. Jones for Eric Lancaster (Filing fee \$ 100 receipt number 0542-13396337) by on behalf of Google LLC. (Attachments: # 1 Proposed Order)(Jones, Michael) (Entered: 03/27/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		03/28/2020	Text Order GRANTING 11 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order. entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 03/28/2020)	
<input type="checkbox"/>	Free	12	03/30/2020	Second MOTION for Extension of Time to File Answer re 1 Complaint or Otherwise Respond by Google LLC. (Attachments: # 1 Proposed Order) (Jones, Michael) (Entered: 03/30/2020)	
<input type="checkbox"/>	Runner		03/31/2020	Text Order GRANTING 12 Motion for Extension of Time to Answer entered by Judge Alan D Albright. Came on for consideration is Defendant's Motion. Noting that it is unopposed, the Court GRANTS the Motion. Defendant shall have up to and including May 27, 2020 to answer or otherwise respond to Plaintiff's Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 03/31/2020)	
<input type="checkbox"/>	Runner		03/31/2020	Reset Answer Deadlines: Google LLC answer due 5/27/2020. (bw) (Entered: 03/31/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	13	04/01/2020	NOTICE of Attorney Appearance by Bijal V. Vakil on behalf of Google LLC. Attorney Bijal V. Vakil added to party Google LLC(pty:dft) (Vakil, Bijal) (Entered: 04/01/2020)	
<input type="checkbox"/>	Online	14	04/01/2020	NOTICE of Attorney Appearance by Sharnita D. Etienne-Cummings on behalf of Google LLC. Attorney Sharnita D. Etienne-Cummings added to party Google LLC(pty:dft) (Etienne-Cummings, Sharnita) (Entered: 04/01/2020)	
<input type="checkbox"/>	Online	15	04/23/2020	MOTION to Appear Pro Hac Vice by Michael E. Jones Michael J. Songer (Filing fee \$ 100 receipt number 0542-13493184) by on behalf of Google LLC. (Jones, Michael) (Entered: 04/23/2020)	
<input type="checkbox"/>	Printer		04/24/2020	Text Order GRANTING 15 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order. entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 04/24/2020)	
<input type="checkbox"/>	Free	16	05/27/2020	ANSWER to 1 Complaint by Google LLC.(Jones, Michael) (Entered: 05/27/2020)	
<input type="checkbox"/>	Free	17	05/27/2020	RULE 7 DISCLOSURE STATEMENT filed by Google LLC. (Jones, Michael) (Entered: 05/27/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	18	05/27/2020	Opposed Motion for leave to File Sealed Document (Attachments: # 1 Sealed Document, # 2 Sealed Document, # 3 Sealed Document, # 4 Sealed Document, # 5 Sealed Document, # 6 Sealed Document, # 7 Proposed Order) (Jones, Michael) (Entered: 05/27/2020)	
<input type="checkbox"/>	Pres.	19	05/27/2020	Opposed MOTION to Change Venue by Google LLC. (Attachments: # 1 Affidavit Sealed, # 2 Affidavit Sealed, # 3 Exhibit 1 Lexis Advance search, # 4 Exhibit 2 EcoFactor SEC Form E, # 5 Exhibit 3 PAIR attorneys, # 6 Exhibit Sealed, # 7 Exhibit Sealed, # 8 Exhibit Sealed, # 9 Exhibit 7 Steinberg LinkedIn, # 10 Exhibit 8 Steinberg CA Bar, # 11 Exhibit 9 EcoFactor Field Trial Results, # 12 Exhibit 10 CIBR report, # 13 Exhibit 11 Arrest, # 14 Exhibit 12 Oia email, # 15 Exhibit 13 TTC complaint - music, # 16 Exhibit 14 Docket Navigator, # 17 Proposed Order) (Jones, Michael) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	20	05/27/2020	Unopposed Motion for leave to File Sealed Document (Attachments: # 1 Sealed Document, # 2 Sealed Document, # 3 Sealed Document, # 4 Sealed Document, # 5 Sealed Document, # 6 Sealed Document, # 7 Proposed Order) (Jones, Michael) (Entered: 05/27/2020)	
<input type="checkbox"/>	Runner		05/29/2020	Text Order MOOTING 18 Motion for Leave to File Sealed Document entered by Judge Alan D Albright. In light of ECF No. 20, the Court MOOTS this motion. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 05/29/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		05/29/2020	Text Order GRANTING 20 Motion for Leave to File Sealed Document entered by Judge Alan D Albright. Before the Court is Defendant Google LLC's Unopposed Motion for Leave to File Under Seal. The Court GRANTS the motion. The Clerk's Office is directed to file under seal Defendants Google LLCs Opposed Motion to Transfer Venue to the Northern District of California, the Declaration of Shannon Shaper, and Exhibits 4-6 to the Declaration of Bijal Vakil. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 05/29/2020)	
<input type="checkbox"/>	Online	21	05/29/2020	Sealed Motion filed: Google LLCs Opposed Motion to Transfer Venue to the Northern District of California (Attachments: # 1 DECLARATION OF SHANNON SHAPER, # 2 DECLARATION OF BIJAL VAKIL, # 3 Exhibit, # 4 Exhibit, # 5 Exhibit) (lad) (Entered: 05/29/2020)	
<input type="checkbox"/>	Online	22	06/03/2020	Unopposed Motion for leave to File Sealed Document (Attachments: # 1 Sealed Document Opposition, # 2 Proposed Order) (Chung, C.) (Entered: 06/03/2020)	
<input type="checkbox"/>	Free	23	06/03/2020	Response in Opposition to Motion, filed by EcoFactor, Inc., re 19 Opposed MOTION to Change Venue filed by Defendant Google LLC (Attachments: # 1 Affidavit of Shayan Habib, # 2 Affidavit of C. Jay Chung, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8, # 11 Exhibit 9, # 12 Exhibit 10, # 13 Proposed Order)(Chung, C.) (Entered: 06/03/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Former		06/05/2020	Text Order GRANTING 22 Motion for Leave to File Sealed Document entered by Judge Alan D Albright. Before the Court is Plaintiff EcoFactor, Inc.'s Unopposed Motion to Seal Its Opposition to Google's Motion to Transfer Venue to the Northern District of California. The Court GRANTS the motion. The Clerk's Office is directed to file EcoFactor's Opposition to Google's Motion to Transfer Venue to the Northern District of California shall be filed under seal. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 06/05/2020)	
<input type="checkbox"/>	Online	24	06/05/2020	Sealed Document filed. (bw) (Entered: 06/03/2020)	
<input type="checkbox"/>	Online	25	06/10/2020	Unopposed Motion for leave to File Sealed Document (Attachments: # 1 Exhibit 1 - Reply filed under seal, # 2 Exhibit 2 - Declaration filed under seal, # 3 Proposed Order) (Jones, Michael) (Entered: 06/10/2020)	
<input type="checkbox"/>	Former		06/11/2020	Text Order GRANTING 25 Motion for Leave to File Sealed Document entered by Judge Alan D Albright. Before the Court is Defendant Google LLC's Unopposed Motion for Leave to File Under Seal. The Court GRANTS the motion. The Clerk's Office is directed to file under seal Defendant Google LLC's Reply in Support of its Motion to Transfer Venue to the Northern District of California and the Supplemental Declaration of Shannon Shaper.(This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 06/11/2020)	
<input type="checkbox"/>	Online	26	06/11/2020	ORDER GOVERNING PROCEEDINGS PATENT CASE. This case is SET for a telephonic Rule 16 Case Management Conference on Friday, June 26, 2020 at 2:00 p.m before Judge Alan D Albright. Signed by Judge Alan D Albright. (bw) (Entered: 06/11/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	27	06/11/2020	Sealed Document filed. GOOGLE LLC'S REPLY IN SUPPORT OF ITS MOTION TO TRANSFER VENUE TO THE NORTHERN DISTRICT OF CALIFORNIA. (Attachments: # 1 Exhibit) (bw) (Entered: 06/11/2020)	
<input type="checkbox"/>	Online	28	06/17/2020	AMENDED COMPLAINT FOR PATENT INFRINGEMENT against Google LLC amending 1 Complaint., filed by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4)(Mirzala, Pers) (Entered: 06/17/2020)	
<input type="checkbox"/>	Online	29	06/26/2020	ORDER setting Telephone Conference for 6/29/2020 02:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (lad) (Entered: 06/26/2020)	
<input type="checkbox"/>	Online	30	06/29/2020	ORDER CANCELLING TELEPHONIC SCHEDULING CONFERENCE. TELEPHONIC SCHEDULING CONFERENCE on Monday, June 29, 2020 at 02:30 PM is hereby CANCELLED until further order of the court. Signed by Judge Alan D Albright. (bw) (Entered: 06/29/2020)	
<input type="checkbox"/>	Online	31	07/01/2020	ANSWER to 28 Amended Complaint with Jury Demand by Google LLC.(Jones, Michael) (Entered: 07/01/2020)	
<input type="checkbox"/>	Online	32	07/14/2020	CORRECTED MOTION for Agreed Scheduling Order by EcoFactor, Inc.. (Attachments: # 1 Exhibit A) (Mirzala, Pers) (Entered: 07/14/2020)	
<input type="checkbox"/>	Former		07/16/2020	Text Order GRANTING 32 Motion entered by Judge Alan D Albright. Before the Court is the Parties' Joint Motion for Entry of the Scheduling Order. The Court GRANTS the motion. The Clerk's Office is directed to enter Exhibit A attached hereto as the scheduling order for this case. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/16/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	23	07/16/2020	<p>AGREED SCHEDULING ORDER: Markman Hearing set for 12/9/2020 01:30 PM before Judge Alan D Albright. Joinder of Parties due by 1/20/2021. Amended Pleadings due by 3/3/2021. Dispositive Motions due by 9/15/2021. Pretrial Conference set for 11/17/2021 09:00 AM before Judge Alan D Albright. Jury Selection and Trial set for 12/6/2021 09:00AM before Judge Alan D Albright. (bw) (Entered: 07/16/2020)</p>	
<input type="checkbox"/>	Online	24	10/06/2020	<p>BRIEF by Google LLC. (Attachments: # 1 Declaration of D. Turnbull, # 2 Declaration of B. Vakil, # 3 Ex. 1 US8180492 file history, # 4 Ex. 2 US8180492 file history, # 5 Ex. 3 US8180492 file history, # 6 Ex. 4 US8180492 file history, # 7 Ex. 5 WDTX-DF-EE_0000001, # 8 Ex. 6 WDTX-DF-EE_0000013, # 9 Ex. 7 WDTX-DF-EE_0000019, # 10 Ex. 8 WDTX-DF-EE_0000029, # 11 Ex. 9 WDTX-DF-EE_0000005, # 12 Ex. 10 WDTX-DF-EE_0000003, # 13 Ex. 11 WDTX-DF-EE_0000005, # 14 Ex. 12 WDTX-DF-EE_0000050, # 15 Ex. 13 WDTX-DF-EE_0000056)(Jones, Michael) (Entered: 10/06/2020)</p>	
<input type="checkbox"/>	Online	35	10/06/2020	<p>BRIEF by EcoFactor, Inc.. (Attachments: # 1 Affidavit of Robert Zedman, # 2 Affidavit of Reza Mirzade, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8, # 11 Exhibit 9, # 12 Exhibit 10, # 13 Exhibit 11)(Mirzade, Reza) (Entered: 10/06/2020)</p>	
<input type="checkbox"/>	Online	36	10/27/2020	<p>BRIEF regarding 35 Brief, by Google LLC. (Attachments: # 1 Turnbull Declaration)(Jones, Michael) (Entered: 10/27/2020)</p>	
<input type="checkbox"/>	Online	37	10/27/2020	<p>BRIEF regarding 34 Brief, by EcoFactor, Inc.. (Attachments: # 1 Affidavit of Robert Zedman)(Mirzade, Reza) (Entered: 10/27/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceedings	Source
<input type="checkbox"/>		38	11/10/2020	35 Brief, by EcoFactor, Inc., (Mirzale, Reza) (Entered: 11/10/2020)	
<input type="checkbox"/>	Online	39	11/10/2020	BRIEF regarding 35 Brief, by Google LLC. (Jones, Michael) (Entered: 11/10/2020)	
<input type="checkbox"/>	Free	40	11/17/2020	NOTICE Joint Claim Construction Statement by Google LLC (Jones, Michael) (Entered: 11/17/2020)	
<input type="checkbox"/>	Free	41	11/24/2020	Opposed MOTION to Stay Case Pending Transfer by Google LLC. (Attachments: # 1 Proposed Order) (Jones, Michael) (Entered: 11/24/2020)	
<input type="checkbox"/>	Online	42	11/30/2020	NOTICE of Attorney Appearance by Kristopher R. Davis on behalf of EcoFactor, Inc.. Attorney Kristopher R. Davis added to party EcoFactor, Inc. (ply:pla) (Davis, Kristopher) (Entered: 11/30/2020)	
<input type="checkbox"/>	Online	43	11/30/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for Brian W. Lewis (Filing fee \$ 100 receipt number 0542-14230640) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 11/30/2020)	
<input type="checkbox"/>	Online	44	12/01/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for James N. Pickens (Filing fee \$ 100 receipt number 0542-14235456) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 12/01/2020)	
<input type="checkbox"/>	Online	45	12/01/2020	Response in Opposition to Motion, filed by EcoFactor, Inc., re 41 Opposed MOTION to Stay Case Pending Transfer filed by Defendant Google LLC (Chung, C.) (Entered: 12/01/2020)	
<input type="checkbox"/>	Online	46	12/02/2020	NOTICE of Waiver of Reply by Google LLC re 41 Opposed MOTION to Stay Case Pending Transfer (Jones, Michael) (Entered: 12/02/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number		12/03/2020	<p>Text Order GRANTING 43 Motion to Appear Pro Hac Vice for Attorney Brian W. Lewis for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D. Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6)</p> <p>(Entered: 12/03/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		12/03/2020	Text Order GRANTING 44 Motion to Appear Pro Hac Vice for Attorney James N. Pickens for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 12/03/2020)	
<input type="checkbox"/>	Online	47	12/08/2020	MOTION to Appear Pro Hac Vice by Michael E. Jones (Filing fee \$ 100 receipt number 0542-14258465) by on behalf of Google LLC. (Jones, Michael) (Entered: 12/08/2020)	
<input type="checkbox"/>	Online	48	12/08/2020	NOTICE of Attorney Appearance by Brian W. Lewis on behalf of EcoFactor, Inc. (Lewis, Brian) (Entered: 12/08/2020)	
<input type="checkbox"/>	Online	49	12/08/2020	NOTICE of Attorney Appearance by James N. Pickens on behalf of EcoFactor, Inc. (Pickens, James) (Entered: 12/08/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		12/09/2020	<p>Text Order GRANTING 47 Motion to Appear Pro Hac Vice for Attorney Henry Huang for Google LLC.</p> <p>Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 12/09/2020)</p>	
<input type="checkbox"/>	Online	50	12/09/2020	<p>Minute Entry for proceedings held before Judge Alan D Albright: Markman Hearing held on 12/9/2020. Case called for Markman Hearing for this and 2 companion cases. The Court heard argument regarding one claim term. After hearing argument the Court determined that he will adopt the defendant's alternative proposed construction. The Court swore Todd Lanis into the TXWD. The Court states that December 6, 2021 is the jury trial date with the voir dire being handled either Thursday or Friday before that by the magistrate judge. There will be 7 jurors, 4 strikes on each side. The Court will determine the number of hours allowed at the pretrial conference. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.)(am) (Entered: 12/09/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	51	12/09/2020	TRANSCRIPT REQUEST by Google LLC for proceedings held on 12/9/20. Proceedings Transcribed: Markman Hearing. Court Reporter: Kristie Davis. (Jones, Michael) (Main Document 51 replaced on 12/9/2020) (am). (Entered: 12/09/2020)	
<input type="checkbox"/>	Online	52	12/09/2020	TRANSCRIPT REQUEST by EcoFactor, Inc. for proceedings held on 12/9/20. Proceedings Transcribed: Markman Hearing. Court Reporter: Kristie Davis. (Chung, C.) (Entered: 12/09/2020)	
<input type="checkbox"/>	Online	53	12/11/2020	Transcript filed of Proceedings held on 12-9-20, Proceedings Transcribed: Markman hearing. Court Reporter/Transcriber: Kristie Davis, Telephone number: 254-340-6114. Parties are notified of their duty to review the transcript to ensure compliance with the FRCP 5.2(a)/FRCrP 49.1(a). A copy may be purchased from the court reporter or viewed at the clerk's office public terminal. If redaction is necessary, a Notice of Redaction Request must be filed within 21 days. If no such Notice is filed, the transcript will be made available via PACER without redaction after 90 calendar days. The clerk will mail a copy of this notice to parties not electronically noticed Redaction Request due 1/1/2021, Redacted Transcript Deadline set for 1/11/2021, Release of Transcript Restriction set for 3/11/2021. (kd) (Entered: 12/11/2020)	
<input type="checkbox"/>	Free	54	02/09/2021	Opposed MOTION for Hearing re 41 Opposed MOTION to Stay Case Pending Transfer by Google LLC. (Attachments: # 1 Proposed Order)(Jones, Michael) (Entered: 02/09/2021)	
<input type="checkbox"/>	Online	55	02/12/2021	Standing Order Regarding Filing Documents Under Seal and Redacted Pleadings in Patent Cases. Signed by Judge Alan D Albright, as of 2/12/2021. (bot1) (Entered: 02/24/2021)	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	56	02/26/2021	ORDER Setting Zoom Motion Hearing for 3/8/2021 01:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (bot1) (Entered: 02/26/2021)	Events since last full update

Retrieve Document(s)

Patents

Number	Title	Issued	Class	Subclass
8,186,492	System and method for using a networked electronic device as an occupancy sensor for an energy management system	05/15/2012	700	276
8,412,488	System and method for using a network of thermostats as tool to verify peak demand reduction	04/02/2013	702	182
8,738,327	System and method for using a network of thermostats as tool to verify peak demand reduction	05/27/2014	702	182
10,534,382	System and method for using a wireless device as a sensor for an energy management system	01/14/2020	1	1

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US District Court Docket

United States District Court, Texas Western

(Waco)

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Header

Case Number: 6:20cv78

Class Code: Open

Date Filed: 01/31/2020

Statute: 35:271

Assigned To: Judge Alan D Albright

Jury Demand: Both

Nature of Suit: Patent (830)

Demand Amount: \$0

Cause: Patent Infringement

NOS Description: Patent

Lead Docket: None

Other Docket: None

Jurisdiction: Federal Question

Litigants

Attorneys

EcoFactor, Inc.

Brian W. Lewis

Plaintiff

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Email:bilewis@raklaw.Com

Litigants

Attorneys

James N. Pickens

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email:Jpickens@raklaw.Com

C. Jay Chung

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Jchung@raklaw.Com

Kristopher R. Davis

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Kdavis@raklaw.Com

Marc A. Fenster

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email:Mafenster@raklaw.Com

Paul A. Kroeger

Litigants

~~Paul H. Kroeger~~
~~Attorneys~~
~~ATTORNEY TO BE NOTICED~~

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor
Los Angeles, CA 90025
USA
(310) 826-7474 Fax: (310) 826-6991
Email:Pkroeger@raklaw.Com

Reza Mirzaie
ATTORNEY TO BE NOTICED
Russ August & Kabat
12424 Wilshire Blvd., 12th Floor
Los Angeles, CA 90025
USA
310-826-7474 Fax: 310-826-6991
Email:Rmirzaie@raklaw.Com

Ecobee, Inc.

Defendant

Daisy Manning
LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED
Husch Blackwell LLP
190 Carondelet Plaza, Suite 600
St. Louis, MO 63105
USA
314-480-1500 Fax: 314-480-1505
Email:Daisy.Manning@huschblackwell.Com

Kara R. Fussner
LEAD ATTORNEY;ATTORNEY TO BE NOTICED
Husch Blackwell LLP
190 Carondelet Plaza, Suite 600
St Louis, MO 63105
USA
314-345-6229 Fax: 314-480-1505
Email:Kara.Fussner@huschblackwell.Com

Rudolph A. Telscher , Jr.
LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Litigants

NOTICED
Attorneys
Husch Blackwell LLP

190 Carondelet Plaza, Suite 600

St Louis, MO 63105

USA

(314) 480-1500 Fax: 314-480-1505

Email: Rudy.Telscher@huschblackwell.Com

Ryan B. Hauer

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE

NOTICED

Husch Blackwell LLP

120 South Riverside Plaza, Suite 2200

Chicago, IL 60606

USA

312-526-1572 Fax: 312-655-1501

Email: Ryan.Hauer@huschblackwell.Com

Jennifer Parker Ainsworth

ATTORNEY TO BE NOTICED

Wilson, Robertson & Cornelius PC

909 Ese Loop 323, Suite 400

Tyler, TX 75701

USA

(903) 509-5000

Email: Jainsworth@wilsonlawfirm.Com

Manny J. Caixeiro

ATTORNEY TO BE NOTICED

Dentons US LLP

601 South Figueroa Street, Suite 2500

Los Angeles, CA 90017

USA

(213) 892-5010 Fax: (213) 623-9924

Email: Manny.Caixeiro@dentons.Com

Timothy J. Carroll

ATTORNEY TO BE NOTICED

Dentons US LLP

Litigants

DENTONS US LLP
Attorneys
233 South Wacker Drive, Suite 5900

Chicago, IL 60606

USA

(312) 876-8544 Fax: (312) 876-7934

Email: Tim.Carroll@dentons.Com

Proceedings

Retrieve Document(s)

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Free	1	01/31/2020	COMPLAINT (Filing fee \$ 400 receipt number 0542-13152951), filed by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Civil Cover Sheet)(Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online	2	01/31/2020	RULE 7 DISCLOSURE STATEMENT filed by EcoFactor, Inc.. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online	3	01/31/2020	NOTICE of AO 120 Patent Report Form by EcoFactor, Inc. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Free	4	01/31/2020	REQUEST FOR ISSUANCE OF SUMMONS by EcoFactor, Inc.. (Mirzaie, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Online		01/31/2020	Case assigned to Judge Alan D Albright. CM WILL NOW REFLECT THE JUDGE INITIALS AS PART OF THE CASE NUMBER. PLEASE APPEND THESE JUDGE INITIALS TO THE CASE NUMBER ON EACH DOCUMENT THAT YOU FILE IN THIS CASE. (lad) (Entered: 02/03/2020)	
<input type="checkbox"/>	Partner		02/03/2020	Notice to Attorneys filing new patent cases: Please use the event "Notice of Filing of Patent/Trademark Form" when filing the AO-120 at case opening. (lad) (Entered: 02/03/2020)	
<input type="checkbox"/>	Online	5	02/03/2020	Notice of Filing of Patent/Trademark Form (AO 120). AO 120 forwarded to the Director of the U.S. Patent and Trademark Office. (Mirzaie, Reza) (Entered: 02/03/2020)	

<input type="checkbox"/>	Availability Online	# 6	Date 02/03/2020	Proceeding Text Summons Issued as to Ecobee, Inc. (lad) (Entered: 02/03/2020)	Source
<input type="checkbox"/>	Online	7	03/24/2020	STANDING ORDER from U.S. District Judge Alan D. Albright regarding scheduled civil hearings. (tada) (Entered: 03/25/2020)	
<input type="checkbox"/>	File	8	04/22/2020	WAIVER OF SERVICE Returned Executed by EcoFactor, Inc. as to Ecobee, Inc.. Waiver sent on 2/27/2020, answer due 4/27/2020. (Mirzale, Reza) (Entered: 04/22/2020)	
<input type="checkbox"/>	Online	9	04/27/2020	Unopposed MOTION for Extension of Time to File Answer re : Complaint by Ecobee, Inc.. (Attachments: # 1 Proposed Order)(Ainsworth, Jennifer) (Entered: 04/27/2020)	
<input type="checkbox"/>	Online	10	04/27/2020	NOTICE of Attorney Appearance by Jennifer Parker Ainsworth on behalf of Ecobee, Inc.. Attorney Jennifer Parker Ainsworth added to party Ecobee, Inc.(pty:dft) (Ainsworth, Jennifer) (Entered: 04/27/2020)	
<input type="checkbox"/>	Online	11	04/28/2020	Pro Hac Vice Letter to Timothy Carroll and Manny J. Caixeiro (lad) (Entered: 04/28/2020)	
<input type="checkbox"/>	Runner		04/28/2020	Text Order GRANTING 9 Motion for Extension of Time to Answer entered by Judge Alan D Albright. Came on for consideration is Defendant's Motion. Noting that it is unopposed, the Court GRANTS the Motion. Defendant shall have up to and including May 27, 2020 to answer or otherwise respond to Plaintiff's Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 04/28/2020)	
<input type="checkbox"/>	Runner		04/28/2020	Reset Answer Deadlines: Ecobee, Inc. answer due 5/27/2020. (bw) (Entered: 04/28/2020)	
<input type="checkbox"/>	Online	12	05/08/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Timothy J. Carroll) (Filing fee \$ 100 receipt number 0542-13550850) by on behalf of Ecobee, Inc.. (Attachments: # 1 Exhibit, # 2 Proposed Order)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text (Ainsworth, Jennifer) (Entered: 05/08/2020)	Source
<input type="checkbox"/>	Online	13	05/08/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Manny J. Calzeiro (Filing fee \$ 100 receipt number 0542-13550919) by on behalf of Ecobee, Inc.. (Attachments: # 1 Exhibit, # 2 Proposed Order) (Ainsworth, Jennifer) (Entered: 05/08/2020)	
<input type="checkbox"/>	Runne:		05/09/2020	Text: Order GRANTING 12 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order. entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 05/09/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Render		05/09/2020	Text Order GRANTING 13 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order. entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jv) (Entered: 05/09/2020)	
<input type="checkbox"/>	Online	14	05/27/2020	ANSWER to 1 Complaint with Jury Demand by Ecobee, Inc..(Ainsworth, Jennifer) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	15	05/27/2020	Opposed MOTION to Change Venue by Ecobee, Inc.. (Attachments: # 1 Affidavit Declaration of Jon Prosser, # 2 Affidavit Declaration of Maury Calixano, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Proposed Order) (Ainsworth, Jennifer) (Entered: 05/27/2020)	
<input type="checkbox"/>	Free	16	05/27/2020	RULE 7 DISCLOSURE STATEMENT filed by Ecobee, Inc.. (Ainsworth, Jennifer) (Entered: 05/27/2020)	
<input type="checkbox"/>	Free	17	06/03/2020	Response in Opposition to Motion, filed by EcoFactor, Inc., re 15 Opposed MOTION to Change Venue filed by Defendant Ecobee, Inc. (Attachments: # 1 Affidavit of Shayan Habib)(Chung, C.) (Entered: 06/03/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Free	18	06/10/2020	REPLY to Response to Motion, filed by Ecobee, Inc., re 15 Opposed MOTION to Change Venue filed by Defendant Ecobee, Inc. (Ainsworth, Jennifer) (Entered: 06/10/2020)	
<input type="checkbox"/>	Online	19	06/11/2020	ORDER GOVERNING PROCEEDINGS PATENT CASE:Telephonic Rule 16 Case Management Conference on 6/26/2020 02:00 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (lad) (Entered: 06/11/2020)	
<input type="checkbox"/>	Online	20	06/26/2020	ORDER. Telephone Conference set for 6/29/2020 02:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (am) (Entered: 06/26/2020)	
<input type="checkbox"/>	Free	21	06/29/2020	ORDER CANCELLING TELEPHONIC SCHEDULING CONFERENCE. TELEPHONIC SCHEDULING CONFERENCE on Monday, June 29, 2020 at 02:30 PM is hereby CANCELLED until further order of the court. Signed by Judge Alan D Albright. (bw) (Entered: 06/29/2020)	
<input type="checkbox"/>	Online	23	07/14/2020	CORRECTED MOTION for Agreed Scheduling Order by EcoFactor, Inc.. (Attachments: # 1 Exhibit A) (Mirzaie, Reza) (Entered: 07/14/2020)	
<input type="checkbox"/>	Online	24	07/15/2020	NOTICE of Withdrawal by EcoFactor, Inc. re 22 MOTION for Agreed Scheduling Order (Mirzaie, Reza) (Entered: 07/15/2020)	
<input type="checkbox"/>	Online	25	07/15/2020	DEFICIENCY NOTICE: re 24 Notice (Other) (lad) (Entered: 07/15/2020)	
<input type="checkbox"/>	Online	26	07/15/2020	MOTION to Withdraw 22 MOTION for Agreed Scheduling Order Corrected by EcoFactor, Inc.. (Attachments: # 1 Proposed Order)(Mirzaie, Reza) (Entered: 07/15/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		07/16/2020	Text Order GRANTING 23 Motion entered by Judge Alan D Albright. Before the Court is the Parties' Joint Motion for Entry of the Scheduling Order. The Court GRANTS the motion. The Clerk's Office is directed to enter Exhibit A attached hereto as the scheduling order for this case. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/16/2020)	
<input type="checkbox"/>	Runner		07/16/2020	Text Order GRANTING 26 Motion to Withdraw entered by Judge Alan D Albright. Before the Court is Plaintiff EcoFactor, Inc.'s Motion for Withdrawal of the Motion for Agreed Scheduling Order filed on July 13, 2020 at ECF No. 22. After consideration, the Court GRANTS the Motion. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/16/2020)	
<input type="checkbox"/>	Free	27	07/16/2020	SCHEDULING ORDER: Markman Hearing set for 12/9/2020 01:30 PM before Judge Alan D Albright. Joinder of Parties due by 1/20/2021, Amended Pleadings due by 3/3/2021. Dispositive/Daubert Motions due by 9/15/2021, Pretrial Conference set for 11/17/2021 09:00 AM before Judge Alan D Albright, Jury Selection and Trial set for 12/6/2021 09:00 AM before Judge Alan D Albright. Signed by Judge Alan D Albright. (lad) (Entered: 07/16/2020)	
<input type="checkbox"/>	Online	28	09/22/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Kara R. Fussner) (Filing fee \$ 100 receipt number 0542-13992086) by on behalf of Ecobee, Inc.. (Attachments: # 1 Proposed Order/Ainsworth, Jennifer) (Entered: 09/22/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	29	09/22/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Ryan B. Hauer) (Filing fee \$ 100 receipt number 0542-13992112) by on behalf of Ecobee, Inc.. (Attachments: # 1 Proposed Order)(Ainsworth, Jennifer) (Entered: 09/22/2020)	
<input type="checkbox"/>	Online	30	09/22/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Daisy Manning) (Filing fee \$ 100 receipt number 0542-13992232) by on behalf of Ecobee, Inc.. (Attachments: # 1 Proposed Order)(Ainsworth, Jennifer) (Entered: 09/22/2020)	
<input type="checkbox"/>	Online	31	09/22/2020	MOTION to Appear Pro Hac Vice by Jennifer Parker Ainsworth (Motion for Admission Pro Hac Vice for Rudolph A. Telscher, Jr.) (Filing fee \$ 100 receipt number 0542-13992255) by on behalf of Ecobee, Inc.. (Attachments: # 1 Proposed Order)(Ainsworth, Jennifer) (Entered: 09/22/2020)	
<input type="checkbox"/>	Former		09/23/2020	Text Order GRANTING 28 Motion to Appear Pro Hac Vice for Attorney Kara R. Fussner for Ecobee, Inc.. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no	

<input type="checkbox"/>	Availability	#	Date	document associated with this entry.) (sm3) Proceeding Text (Entered: 09/23/2020)	Source
<input type="checkbox"/>	Number		09/23/2020	<p>Text Order GRANTING 29 Motion to Appear Pro Hac Vice for Attorney Ryan B. Hauer for Ecobee, Inc..</p> <p>Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (sm3)</p> <p>(Entered: 09/23/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number		09/23/2020	<p>Text Order GRANTING 30 Motion to Appear Pro Hac Vice for Attorney Daisy Manning for Ecobee, Inc..</p> <p>Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (sm3)</p> <p>(Entered: 09/23/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runter		09/23/2020	Text Order GRANTING 31 Motion to Appear Pro Hac Vice for Attorney Rudolph A. Teischer, Jr for Ecobee, Inc.. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (sm3) (Entered: 09/23/2020)	
<input type="checkbox"/>	Online	32	10/06/2020	BRIEF by Ecobee, Inc.. (Attachments: # 1 Affidavit Declaration of Don Turnbull, # 2 Affidavit Declaration of Bijal Vakil, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8, # 11 Exhibit 9, # 12 Exhibit 10, # 13 Exhibit 11, # 14 Exhibit 12, # 15 Exhibit 13)(Answers, Jennifer) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	33	10/06/2020	BRIEF by EcoFactor, Inc.. (Attachments: # 1 Affidavit of Polart Zaidman, # 2 Affidavit Peza Mirzale, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8, # 11 Exhibit 9, # 12 Exhibit 10, # 13 Exhibit 11)(Mirzale, Reza) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	34	10/27/2020	BRIEF regarding 32 Brief, by EcoFactor, Inc..	

<input type="checkbox"/>	Availability	#	Date	(Attachments: # 1 Affidavit of Robert Zaidman) Proceeding Text (Mirzale, Reza) (Entered: 10/27/2020)	Source
<input type="checkbox"/>	Free	35	10/27/2020	BRIEF regarding 33 Brief, by Ecobee, Inc.. (Attachments: # 1 Affidavit Declaration of Don Turnbull)(Ainsworth, Jennifer) (Entered: 10/27/2020)	
<input type="checkbox"/>	Online	36	11/10/2020	BRIEF regarding 32 Brief, by Ecobee, Inc.. (Ainsworth, Jennifer) (Entered: 11/10/2020)	
<input type="checkbox"/>	Online	37	11/10/2020	BRIEF regarding 33 Brief, by EcoFactor, Inc.. (Mirzale, Reza) (Entered: 11/10/2020)	
<input type="checkbox"/>	Online	38	11/17/2020	NOTICE Joint Claim Construction Statement by Ecobee, Inc. (Ainsworth, Jennifer) (Entered: 11/17/2020)	
<input type="checkbox"/>	Online	39	11/24/2020	Opposed MOTION to Stay Case Pending Transfer by Ecobee, Inc.. (Attachments: # 1 Proposed Order) (Ainsworth, Jennifer) (Entered: 11/24/2020)	
<input type="checkbox"/>	Online	40	11/30/2020	NOTICE of Attorney Appearance by Kristopher R. Davis on behalf of EcoFactor, Inc.. Attorney Kristopher R. Davis added to party EcoFactor, Inc. (pty:pla) (Davis, Kristopher) (Entered: 11/30/2020)	Events since last full update
<input type="checkbox"/>	Online	41	11/30/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for Brian W. Lewis (Filing fee \$ 100 receipt number 0542-14230649) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 11/30/2020)	Events since last full update
<input type="checkbox"/>	Online	42	12/01/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for James N. Pickens (Filing fee \$ 100 receipt number 0542-14235503) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 12/01/2020)	Events since last full update
<input type="checkbox"/>	Online	43	12/01/2020	Response in Opposition to Motion, filed by EcoFactor, Inc., re 39 Opposed MOTION to Stay Case Pending Transfer filed by Defendant Ecobee, Inc. (Chung, C.) (Entered: 12/01/2020)	Events since last full update
<input type="checkbox"/>	Online	44	12/02/2020	NOTICE of Waiver of Reply by Ecobee, Inc. re 39 Opposed MOTION to Stay Case Pending Transfer (Ainsworth, Jennifer) (Entered: 12/02/2020)	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number	---	12/03/2020	<p>Text Order GRANTING 41 Motion to Appear Pro Hac Vice for Attorney Brian W. Lewis for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D. Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6)</p> <p>(Entered: 12/03/2020)</p>	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number	--	12/03/2020	Text Order GRANTING 42 Motion to Appear Pro Hac Vice for Attorney James M. Pickens for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 12/03/2020)	Events since last full update
<input type="checkbox"/>	Online	45	12/08/2020	NOTICE of Attorney Appearance by Brian W. Lewis on behalf of EcoFactor, Inc. (Lewis, Brian) (Entered: 12/08/2020)	Events since last full update
<input type="checkbox"/>	Online	46	12/08/2020	NOTICE of Attorney Appearance by James M. Pickens on behalf of EcoFactor, Inc. (Pickens, James) (Entered: 12/08/2020)	Events since last full update
<input type="checkbox"/>	Online	47	12/09/2020	NOTICE of Attorney Appearance by Brian W. Lewis on behalf of EcoFactor, Inc. (Lewis, Brian) (Entered: 12/09/2020)	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	48	12/09/2020	Minute Entry for proceedings held before Judge Alan D. Albright: Markman Hearing held on 12/9/2020. Case called for Markman Hearing for this and 2 companion cases. The Court heard argument regarding one claim term. After hearing argument the Court determined that he will adopt the defendant's alternative proposed construction. The Court swore Todd Lanis into the TXWD. The Court states that December 6, 2021 is the jury trial date with the voir dire being handled either Thursday or Friday before that by the magistrate judge. There will be 7 jurors, 4 strikes on each side. The Court will determine the number of hours allowed at the pretrial conference. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.)(lad) (Entered: 12/09/2020)	Events since last full update
<input type="checkbox"/>	Online	49	12/11/2020	Transcript filed of Proceedings held on 12-9-20, Proceedings Transcribed: Markman hearing. Court Reporter/Transcriber: Kristie Davis, Telephone number: 254-340-6114. Parties are notified of their duty to review the transcript to ensure compliance with the FRCP 5.2(a)/FRCrP 49.1(a). A copy may be purchased from the court reporter or viewed at the clerk's office public terminal. If redaction is necessary, a Notice of Redaction Request must be filed within 21 days. If no such Notice is filed, the transcript will be made available via PACER without redaction after 90 calendar days. The clerk will mail a copy of this notice to parties not electronically noticed Redaction Request due 1/1/2021, Redacted Transcript Deadline set for 1/11/2021, Release of Transcript Restriction set for 3/11/2021, (kd) (Entered: 12/11/2020)	Events since last full update
<input type="checkbox"/>	Online	50	02/12/2021	Standing Order Regarding Filing Documents Under Seal and Redacted Pleadings in Patent Cases.	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Signed by Judge Alan D Albright, as of 2/12/2021. Proceeding Text (bot1) (Entered: 02/24/2021)	Source
<input type="checkbox"/>	Online	51	02/26/2021	ORDER Setting Zoom Motion Hearing for 3/8/2021 01:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (bot1) (Entered: 02/26/2021)	Events since last full update

Retrieve Document(s)

Patents

Number	Title	Issued	Class	Subclass
8,186,492	System and method for using a networked electronic device as an occupancy sensor for an energy management system	05/15/2012	700	276
8,412,488	System and method for using a network of thermostats as tool to verify peak demand reduction	04/02/2013	702	182
8,738,327	System and method for using a network of thermostats as tool to verify peak demand reduction	05/27/2014	702	182
10,534,382	System and method for using a wireless device as a sensor for an energy management system	01/14/2020	1	1

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Content Type: Dockets

Terms: Stay and patent-number(10534382)

Narrow By: Case Status: Open or Unknown or Closed Court: U.S. Circuit Court of Appeals (United States) or United States U.S. District Courts (Civil) or U.S. Supreme Court or U.S. Patent Trial and Appeals Board Except: Civil

Date and Time: Mar 01, 2021 07:23:54 p.m. EST



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Document: 6:20cv80, Ecofactor, Inc. V. Vivint, Inc.

6:20cv80, Ecofactor, Inc. V. Vivint, Inc.

US District Court Docket

United States District Court, Texas Western

(Waco)

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Header

Case Number: 6:20cv80

Class Code: Open

Date Filed: 01/31/2020

Statute: 35:271

Assigned To: Judge Alan D Albright

Jury Demand: Both

Nature of Suit: Patent (830)

Demand Amount: \$0

Cause: Patent Infringement

NOS Description: Patent

Lead Docket: None

Other Docket: None

Jurisdiction: Federal Question

Litigants

Attorneys

EcoFactor, Inc.

Brian W. Lewis

Plaintiff

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Email:blewis@raklaw.Com

Litigants

Attorneys

James N. Pickens

LEAD ATTORNEY;PRO HAC VICE;ATTORNEY TO BE
NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email:Jpickens@raklaw.Com

C. Jay Chung

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Jchung@raklaw.Com

Kristopher R. Davis

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Kdavis@raklaw.Com

Marc A. Fenster

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email:Mafenster@raklaw.Com

Paul A. Kroeger

Litigants

Paul H. Kroeger
Attorneys
ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email:Pkroeger@raklaw.Com

Reza Mirzaie

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email:Rmirzaie@raklaw.Com

Vivint, Inc.

Defendant

Fred I. Williams

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

327 Congress Ave., Suite 490

Austin, TX 78701

USA

512-543-1354 Email:Fwilliams@wsltrial.Com

Jonathan L. Hardt

ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

327 Congress Ave., Suite 490

Austin, TX 78701

USA

5125431354 Email:Jhardt@wsltrial.Com

Todd E. Landis

PRO HAC VICE; ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

2633 McKinney Ave., Suite 130

Dallas, TX 75204

USA

Litigants

USA

Attorneys

512-543-1354 Email: Tlandis@wsitrial.Com

Vivint, Inc.

Counter Plaintiff

Fred I. Williams

LEAD ATTORNEY; ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

327 Congress Ave., Suite 490

Austin, TX 78701

USA

512-543-1354 Email: Fwilliams@wsitrial.Com

Jonathan L. Hardt

ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

327 Congress Ave., Suite 490

Austin, TX 78701

USA

5125431354 Email: Jhardt@wsitrial.Com

Todd E. Landis

PRO HAC VICE; ATTORNEY TO BE NOTICED

Williams Simons & Landis PLLC

2633 McKinney Ave., Suite 130

Dallas, TX 75204

USA

512-543-1354 Email: Tlandis@wsitrial.Com

EcoFactor, Inc.

Counter Defendant

Brian W. Lewis

LEAD ATTORNEY; PRO HAC VICE; ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd. 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Email: BLewis@raklaw.Com

James N. Pickens

LEAD ATTORNEY; PRO HAC VICE; ATTORNEY TO BE NOTICED

Russ August & Kabat

Litigants

Russ August & Kabat
Attorneys
12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Email: Jpickens@raklaw.Com

C. Jay Chung

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email: Jchung@raklaw.Com

Kristopher R. Davis

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email: Kdavis@raklaw.Com

Marc A. Fenster

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

(310) 826-7474 Fax: (310) 826-6991

Email: Mafenster@raklaw.Com

Paul A. Kroeger

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

Litigants

USA

Attorneys

(310) 826-7474 Fax: (310) 826-6991

Email: Pkroeger@raklaw.Com

Reza Mirzale

ATTORNEY TO BE NOTICED

Russ August & Kabat

12424 Wilshire Blvd., 12th Floor

Los Angeles, CA 90025

USA

310-826-7474 Fax: 310-826-6991

Email: Rmirzale@raklaw.Com

Proceedings

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<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Free	1	01/31/2020	COMPLAINT (Filing fee \$ 400 receipt number 0542-13152963), filed by EcoFactor, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Civil Cover Sheet)(Mirzale, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Free	2	01/31/2020	RULE 7 DISCLOSURE STATEMENT filed by EcoFactor, Inc.. (Mirzale, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Free	3	01/31/2020	NOTICE of AO 120 Patent Report Form by EcoFactor, Inc. (Mirzale, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Free	4	01/31/2020	REQUEST FOR ISSUANCE OF SUMMONS by EcoFactor, Inc.. (Mirzale, Reza) (Entered: 01/31/2020)	
<input type="checkbox"/>	Fuller		01/31/2020	Case assigned to Judge Alan D Albright. CM WILL NOW REFLECT THE JUDGE INITIALS AS PART OF THE CASE NUMBER. PLEASE APPEND THESE JUDGE INITIALS TO THE CASE NUMBER ON EACH DOCUMENT THAT YOU FILE IN THIS CASE. (lad) (Entered: 02/03/2020)	
<input type="checkbox"/>	Fuller		02/03/2020	Notice to Attorneys filing new patent cases: Please use the event "Notice of Filing of Patent/Trademark	

<input type="checkbox"/>	Availability	#	Date	Proceeding Filed the AO-120 at case opening. (lad) (Entered: 02/03/2020)	Source
<input type="checkbox"/>	Free	5	02/03/2020	Notice of Filing of Patent/Trademark Form (AO 120). AO 120 forwarded to the Director of the U.S. Patent and Trademark Office. (Mirzaie, Reza) (Entered: 02/03/2020)	
<input type="checkbox"/>	Free	6	02/03/2020	Summons Issued as to Vivint, Inc. (lad) (Entered: 02/03/2020)	
<input type="checkbox"/>	Online	7	03/06/2020	NOTICE of Attorney Appearance by Fred I. Williams on behalf of Vivint, Inc.. Attorney Fred I. Williams added to party Vivint, Inc.(pty:dft) (Williams, Fred) (Entered: 03/06/2020)	
<input type="checkbox"/>	Online	8	03/06/2020	NOTICE of Attorney Appearance by Jonathan L. Hardt on behalf of Vivint, Inc.. Attorney Jonathan L. Hardt added to party Vivint, Inc.(pty:dft) (Hardt, Jonathan) (Entered: 03/06/2020)	
<input type="checkbox"/>	Online	9	03/06/2020	Joint MOTION for Extension of Time to File Answer by Vivint, Inc.. (Attachments: # 1 Proposed Order) (Hardt, Jonathan) (Entered: 03/06/2020)	
<input type="checkbox"/>	Runner		03/07/2020	Text Order GRANTING 9 Motion for Extension of Time to Answer entered by Judge Alan D Albright. Came on for consideration is Parties' Agreed Motion to extend the time for Defendant to Answer. The Court GRANTS the Motion. Defendant shall have up to and including April 6, 2020 to answer or otherwise respond to Plaintiff's Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 03/07/2020)	
<input type="checkbox"/>	Runner		03/07/2020	Set/Reset Deadlines: Vivint, Inc. answer due 4/6/2020. (mcS) (Entered: 03/09/2020)	
<input type="checkbox"/>	Online	10	03/24/2020	STANDING ORDER from U.S. District Judge Alan D. Albright regarding scheduled civil hearings. (tada) (Entered: 03/25/2020)	
<input type="checkbox"/>	Online	11	04/03/2020	Joint MOTION for Extension of Time to File Answer by Vivint, Inc.. (Attachments: # 1 Proposed Order) (Hardt, Jonathan) (Entered: 04/03/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		04/04/2020	Text Order GRANTING 11 Motion for Extension of Time to Answer entered by Judge Alan D Albright. Came on for consideration is Parties' Joint Motion to extend the time for Defendants to Answer. The Court GRANTS the Motion. Defendant shall have up to and including May 27, 2020 to answer or otherwise respond to Plaintiff's Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jv) (Entered: 04/04/2020)	
<input type="checkbox"/>	Runner		04/06/2020	Vivint, Inc. answer due 5/27/2020. Signed by Judge Alan D Albright. (mc5) (Entered: 04/06/2020)	
<input type="checkbox"/>	Online	12	05/27/2020	MOTION to Appear Pro Hac Vice by Fred L. Williams Motion for Todd Landis to Appear Pro Hac Vice (Filing fee \$ 100 receipt number 0542-13607942) by on behalf of Vivint, Inc.. (Attachments: # 1 Proposed Order)/(Williams, Fred) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	13	05/27/2020	ANSWER to 1 Complaint with Jury Demand , COUNTERCLAIM against EcoFactor, Inc. by Vivint, Inc..(Williams, Fred) (Entered: 05/27/2020)	
<input type="checkbox"/>	Online	14	05/27/2020	RULE 7 DISCLOSURE STATEMENT filed by Vivint, Inc.. (Williams, Fred) (Entered: 05/27/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runter		05/29/2020	Text Order GRANTING 12 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order. entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jv) (Entered: 05/29/2020)	
<input type="checkbox"/>	Free	15	06/11/2020	ORDER GOVERNING PROCEEDINGS PATENT CASE, Telephone Conference set for 6/26/2020 02:00 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (am) (Entered: 06/11/2020)	
<input type="checkbox"/>	Online	16	06/15/2020	RESPONSE to 13 Answer to Complaint, Counterclaim by EcoFactor, Inc.. (Mirzaie, Reza) (Entered: 06/15/2020)	
<input type="checkbox"/>	Online	17	06/26/2020	ORDER, Telephone Conference set for 6/29/2020 02:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (am) (Entered: 06/26/2020)	
<input type="checkbox"/>	Online	18	06/29/2020	ORDER CANCELLING TELEPHONIC SCHEDULING CONFERENCE, TELEPHONIC SCHEDULING CONFERENCE on Monday, June 29, 2020 at 02:30 PM is hereby CANCELLED until further order of the court. Signed by Judge Alan D Albright. (bw) (Entered: 06/29/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	20	07/13/2020	Unopposed Motion for leave to File Sealed Document (Attachments: # 1 Sealed Document, # 2 Sealed Document, # 3 Proposed Order) (Williams, Fred) (Entered: 07/13/2020)	
<input type="checkbox"/>	Free	21	07/13/2020	Opposed MOTION to Change Venue by Vivint, Inc.. (Attachments: # 1 Exhibit A, # 2 Proposed Order) (Williams, Fred) (Entered: 07/13/2020)	
<input type="checkbox"/>	Runner		07/14/2020	Text Order GRANTING 20 Motion for Leave to File Sealed Document entered by Judge Alan D Albright. Before the Court is Defendant Vivint, Inc.'s Motion for Leave to File Under Seal. The Court GRANTS the motion. The Clerk's Office is directed to file Defendant's Opposed Motion to Transfer Venue to the Northern District of California and Exhibit A thereto under seal. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/14/2020)	
<input type="checkbox"/>	Online	22	07/14/2020	Sealed Motion filed: Defendant's Opposed Motion to Transfer Venue (Attachments: # 1 Exhibit A) (lad) (Entered: 07/14/2020)	
<input type="checkbox"/>	Free	23	07/14/2020	CORRECTED MOTION for Agreed Scheduling Order by EcoFactor, Inc.. (Attachments: # 1 Exhibit A) (Mirzaie, Reza) (Entered: 07/14/2020)	
<input type="checkbox"/>	Online	24	07/15/2020	NOTICE of Withdrawal by EcoFactor, Inc. re 19 MOTION for Agreed Scheduling Order (Mirzaie, Reza) (Entered: 07/15/2020)	
<input type="checkbox"/>	Online	25	07/15/2020	DEFICIENCY NOTICE: re 24 Notice (Other) (lad) (Entered: 07/15/2020)	
<input type="checkbox"/>	Online	26	07/15/2020	MOTION to Withdraw 19 MOTION for Agreed Scheduling Order Corrected by EcoFactor, Inc.. (Attachments: # 1 Proposed Order)(Mirzaie, Reza) (Entered: 07/15/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Runner		07/16/2020	Text Order GRANTING 23 Motion entered by Judge Alan D Albright. Before the Court is the Parties' Joint Motion for Entry of the Scheduling Order. The Court GRANTS the motion. The Clerk's Office is directed to enter Exhibit A attached hereto as the scheduling order for this case. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/16/2020)	
<input type="checkbox"/>	Runner		07/16/2020	Text Order GRANTING 26 Motion to Withdraw entered by Judge Alan D Albright. Before the Court is Plaintiff EcoFactor, Inc.'s Motion for Withdrawal of the Motion for Agreed Scheduling Order filed on July 13, 2020 at ECF No. 19. After consideration, the Court GRANTS the Motion. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 07/16/2020)	
<input type="checkbox"/>	Free	27	07/16/2020	SCHEDULING ORDER: Markman Hearing set for 12/9/2020 01:30 PM before Judge Alan D Albright. Joinder of Parties due by 1/20/2021, Amended Pleadings due by 3/3/2021. Dispositive/Daubert Motions due by 9/15/2021, Pretrial Conference set for 11/17/2021 09:00 AM before Judge Alan D Albright, Jury Selection and Trial set for 12/6/2021 09:00 AM before Judge Alan D Albright. Signed by Judge Alan D Albright. (lad) (Entered: 07/16/2020)	
<input type="checkbox"/>	Online	28	07/27/2020	Motion for leave to File Sealed Document (Attachments: # 1 Sealed Document Opposition) (Chung, C.) (Entered: 07/27/2020)	
<input type="checkbox"/>	Online	29	07/27/2020	Response in Opposition to Motion, filed by EcoFactor, Inc., re 21 Opposed MOTION to Change Venue filed by Vivint, Inc. (Attachments: # 1 Affidavit of Clay Chung, # 2 Exhibit 1, # 3 Exhibit 2, # 4 Exhibit 3, # 5 Exhibit 4, # 6 Exhibit 5, # 7 Exhibit 6, # 8 Exhibit	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text 10 Exhibit 9)(Chung, C.) (Entered: 07/27/2020)	Source
<input type="checkbox"/>	Online	30	07/27/2020	NOTICE Proposed Order by EcoFactor, Inc. re 28 Motion for leave to File Sealed Document (Chung, C.) (Entered: 07/27/2020)	
<input type="checkbox"/>	Online	31	08/03/2020	REPLY to Response to Motion, filed by Vivint, Inc., re 21 Opposed MOTION to Change Venue filed by Vivint, Inc. (Williams, Fred) (Entered: 08/03/2020)	
<input type="checkbox"/>	Online	32	10/06/2020	BRIEF by EcoFactor, Inc.. (Attachments: # 1 Affidavit of Robert Zeidman, # 2 Affidavit of Raza Mirzaie, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8, # 11 Exhibit 9, # 12 Exhibit 10, # 13 Exhibit 11)(Mirzaie, Raza) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	33	10/06/2020	BRIEF by Vivint, Inc.. (Attachments: # 1 Declaration of D. Turnbull, # 2 Declaration of B. Vafsi, # 3 Exhibit 1 - USS180492 file history, # 4 Exhibit 2 - USS180492 file history, # 5 Exhibit 3 - USS180492 file history, # 6 Exhibit 4 - USS180492 file history, # 7 Exhibit 5 - WDTX-DF-EE_0000001, # 8 Exhibit 6 - WDTY-DF-EE_0000013, # 9 Exhibit 7 - WDTX-DF-EE_0000019, # 10 Exhibit 8 - WDTX-DF-EE_0000029, # 11 Exhibit 9 - WDTX-DF-EE_0000006, # 12 Exhibit 10 - WDTX-DF-EE_0000003, # 13 Exhibit 11 - WDTX-DF-EE_0000005, # 14 Exhibit 12 - WDTY-DF-EE_0000050, # 15 Exhibit 13 - WDTX-DF-EE_0000056)(Williams, Fred) (Entered: 10/06/2020)	
<input type="checkbox"/>	Online	34	10/27/2020	BRIEF regarding 33 Brief, by EcoFactor, Inc.. (Attachments: # 1 Affidavit of Robert Zeidman) (Mirzaie, Raza) (Entered: 10/27/2020)	
<input type="checkbox"/>	Online	35	10/27/2020	BRIEF regarding 32 Brief, by Vivint, Inc.. (Attachments: # 1 Affidavit of Don Turnbull) (Williams, Fred) (Entered: 10/27/2020)	
<input type="checkbox"/>	Online	36	11/10/2020	BRIEF regarding 32 Brief, by EcoFactor, Inc..	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text (Mozelle, Reza) (Entered: 11/10/2020)	Source
<input type="checkbox"/>	Free	37	11/10/2020	BRIEF regarding 33 Brief, by Vivint, Inc.. (Williams, Fred) (Entered: 11/10/2020)	
<input type="checkbox"/>	Online	38	11/17/2020	NOTICE Joint Claim Construction Statement by Vivint, Inc. (Williams, Fred) (Entered: 11/17/2020)	
<input type="checkbox"/>	Online	39	11/30/2020	NOTICE of Joinder by Defendant Vivint, Inc. to the Motion to Stay Filed By Google LLC and ecobee, Inc. in Related Actions by Vivint, Inc. (Williams, Fred) (Entered: 11/30/2020)	
<input type="checkbox"/>	Online	40	11/30/2020	NOTICE of Attorney Appearance by Kristopher R. Davis on behalf of EcoFactor, Inc.. Attorney Kristopher R. Davis added to party EcoFactor, Inc. (pty:pla). Attorney Kristopher R. Davis added to party EcoFactor, Inc.(pty:cd) (Davis, Kristopher) (Entered: 11/30/2020)	
<input type="checkbox"/>	Online	41	11/30/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for Brian W. Lewis (Filing fee \$ 100 receipt number 0542-14230656) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 11/30/2020)	
<input type="checkbox"/>	Online	42	12/01/2020	MOTION to Appear Pro Hac Vice by C. Jay Chung for James N. Pickens (Filing fee \$ 100 receipt number 0542-14235511) by on behalf of EcoFactor, Inc.. (Chung, C.) (Entered: 12/01/2020)	
<input type="checkbox"/>	Online	43	12/01/2020	NOTICE Notice Of Filing Of Plaintiff EcoFactor's Opposition To Defendants Motion To Stay Pending Defendants Transfer Motions by EcoFactor, Inc. re 39 Notice (Other) (Attachments: # 1 Ex. 1)(Chung, C.) (Entered: 12/01/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number		12/03/2020	<p>Text Order GRANTING 41 Motion to Appear Pro Hac Vice for Attorney Brian W. Lewis for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6)</p> <p>(Entered: 12/03/2020)</p>	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Number		12/03/2020	Text Order GRANTING 42 Motion to Appear Pro Hac Vice for Attorney James M. Pickens for EcoFactor, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-1 (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 12/03/2020)	
<input type="checkbox"/>	Online	44	12/08/2020	NOTICE of Attorney Appearance by Brian W. Lewis on behalf of EcoFactor, Inc. (Lewis, Brian) (Entered: 12/08/2020)	
<input type="checkbox"/>	Online	45	12/08/2020	NOTICE of Attorney Appearance by James M. Pickens on behalf of EcoFactor, Inc. (Pickens, James) (Entered: 12/08/2020)	

<input type="checkbox"/>	Availability	#	Date	Proceeding Text	Source
<input type="checkbox"/>	Online	46	12/09/2020	Minute Entry for proceedings held before Judge Alan D. Albright: Markman Hearing held on 12/9/2020. Case called for Markman Hearing for this and 2 companion cases. The Court heard argument regarding one claim term. After hearing argument the Court determined that he will adopt the defendant's alternative proposed construction. The Court swore Todd Lanis into the TXWD. The Court states that December 6, 2021 is the jury trial date with the voir dire being handled either Thursday or Friday before that by the magistrate judge. There will be 7 jurors, 4 strikes on each side. The Court will determine the number of hours allowed at the pretrial conference. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.)(am) (Entered: 12/09/2020)	
<input type="checkbox"/>	Online	47	12/11/2020	Transcript filed of Proceedings held on 12-9-20, Proceedings Transcribed: Markman hearing. Court Reporter/Transcriber: Kristie Davis, Telephone number: 254-340-6114. Parties are notified of their duty to review the transcript to ensure compliance with the FRCP 5.2(a)/FRCrP 49.1(a). A copy may be purchased from the court reporter or viewed at the clerk's office public terminal. If redaction is necessary, a Notice of Redaction Request must be filed within 21 days. If no such Notice is filed, the transcript will be made available via PACER without redaction after 90 calendar days. The clerk will mail a copy of this notice to parties not electronically noticed Redaction Request due 1/1/2021, Redacted Transcript Deadline set for 1/11/2021, Release of Transcript Restriction set for 3/11/2021, (kd) (Entered: 12/11/2020)	
<input type="checkbox"/>	Online	48	02/09/2021	Opposed MOTION for Hearing re 39 Notice (Other) Notice of Joinder to Defendants' Motion to Stay by	Events since last full update

<input type="checkbox"/>	Availability	#	Date	Vivint, Inc., (Attachments: # 1 Proposed Order) Proceeding Text (Williams, Fred) (Entered: 02/09/2021)	Source
<input type="checkbox"/>	Online	49	02/12/2021	Standing Order Regarding Filing Documents Under Seal and Redacted Pleadings in Patent Cases. Signed by Judge Alan D Albright. as of 2/12/2021. (bot1) (Entered: 02/24/2021)	Events since last full update
<input type="checkbox"/>	Online	50	02/26/2021	ORDER Setting Zoom Motion Hearing for 3/8/2021 01:30 PM before Judge Alan D Albright. Signed by Judge Alan D Albright. (bot1) (Entered: 02/26/2021)	Events since last full update

Retrieve Document(s)

Patents

Number	Title	Issued	Class	Subclass
#8,180,492	System and method for using a networked electronic device as an occupancy sensor for an energy management system	05/15/2012	700	276
#8,412,488	System and method for using a network of thermostats as tool to verify peak demand reduction	04/02/2013	702	182
#8,788,327	System and method for using a network of thermostats as tool to verify peak demand reduction	05/27/2014	702	182
#10,534,382	System and method for using a wireless device as a sensor for an energy management system	01/14/2020	1	1

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Content Type: Dockets

Terms: Stay and patent-number(10534382)

Narrow By: Case Status: Open or Unknown or Closed Court: U.S. Circuit Court of Appeals (United States) or United

Date and Time: Mar 01, 2021 07:24:29 p.m. EST



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/014,679	02/12/2021	10534382	024115	6590
20995 7590 03/09/2021 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER HUGHES, DEANDRA M	
			ART UNIT	PAPER NUMBER
			3992	
			MAIL DATE	DELIVERY MODE
			03/09/2021	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



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SUGHRUE MION, PLLC
2000 PENNSYLVANIA AVENUE, N.W.
SUITE 900
WASHINGTON, DC 20006

***EX PARTE* REEXAMINATION COMMUNICATION TRANSMITTAL FORM**

REEXAMINATION CONTROL NO. 90/014,679.

PATENT UNDER REEXAMINATION 10534382.

ART UNIT 3992.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Order Granting Request For Ex Parte Reexamination	Control No. 90/014,679	Patent Under Reexamination 10534382	
	Examiner DEANDRA M HUGHES	Art Unit 3992	AIA (FITF) Status No

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The request for *ex parte* reexamination filed 02/12/2021 has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a) ☒ PTO-892, b) ☐ PTO/SB/08, c) ☐ Other: _____

1. ☒ The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

/D.M.H/
Reexamination Specialist, Art Unit 399

/CHARLES R CRAVER/
Primary Examiner, Art Unit 3992

cc:Requester (if third party requester)

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ORDER GRANTING REQUEST FOR *EX PARTE* REEXAMINATION

Acknowledgements

1. This is an order granting *Ex Parte* Reexamination of claims 1-20 of U.S. Patent No. 10,534,382, (“’382 Patent”) issued January 14, 2020 and filed on April 3, 2019 as U.S. Application No. 16/374,085 (“’085 Application”), titled “SYSTEM AND METHOD FOR USING A WIRELESS DEVICE AS A SENSOR FOR AN ENERGY MANAGEMENT SYSTEM.”

2. The ’382 Patent issued with claims 1-20 (“Patented Claims”) and claims 1 and 17 are independent claims. Thus, claims 1-20 are grouped as follows:

- Claims 1-16; and
- Claims 17-20.

3. Examiners find the ’382 Patent is a subject of a Request for *Inter Partes* Review in IPR2021-00054 filed on October 22, 2020.

4. Examiners do not any previous *Ex parte* reexaminations, supplemental examinations, or certificates of correction for the ’382 Patent.

5. The ’382 Patent was filed on April 3, 2019 with the earliest possible effective filing date of July 14, 2008 because of the priority claim to Provisional Application No. 61/134,714 filed on July 14, 2008.

6. Examiners find the following notice of pending litigation (see Request, pg. 3).

III. NOTICE OF PENDING LITIGATION

The '382 Patent is the subject of four patent infringement lawsuits by the assignee of record, EcoFactor, which may affect, or be affected by, a decision in this proceeding: *EcoFactor, Inc. v. Google LLC*, Case No. 6:20-cv-00075-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Ecobee, Inc.*, Case No. 6:20-cv-00078-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Vivint, Inc.*, Case No. 6:20-cv-00080-ADA (W.D. Tex., filed Jan. 31, 2020); *EcoFactor, Inc. v. Alarm.com Inc.*, 1:20-cv-11007-LTS (D. Mass., filed May 26, 2020).¹

EcoFactor has asserted four patents against Petitioner in the Massachusetts litigation: U.S. Patent Nos. 8,738,327, 8,412,488, 8,180,492 and the '382 Patent.

The '382 Patent is also the subject of a Request for *Inter Partes* Review in IPR2021-00054, which was filed by Google LLC on October 22, 2020.

¹ On December 9, 2020, the Court issued preliminary claim constructions in the Western District of Texas actions. In relevant part, the Court construed the term "measurement" in the claims of the '382 Patent to have its plain and ordinary meaning. Ex. F at 3. No other terms from the '382 Patent claims were construed by the Court.

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Patents/Printed Publications

7. The following prior patents/printed publications are alleged to present an SNQ as to claims 1-20:

- US 2009/0302994A1 to Rhee et al. published Jan. 15, 2004 and field on June 10, 2008 (hereafter “Rhee”);
- US 8,020,777 to Kates issued September 20, 2011 and filed on January 29, 2007 (hereafter “Kates”);
- US 8,239,922 to Sullivan et al. issued on August 7, 2012 and filed on August 27, 2007 (hereafter “Sullivan”).

Proposed Substantial New Questions of Patentability (“SNQs”)

8. The request proposed the following SNQs (see Request pg. 8);

- (1) Rhee anticipates or makes obvious claims 1-20;
- (2) Rhee and Sullivan make obvious claims 7-9 and 15-16.
- (3) Rhee and Kates make obvious claims 1-20;
- (4) Rhee, Sullivan, and Kates make obvious claims 7-9 and 15-16.

Basis of the Substantial New Question of Patentability

9. Under MPEP §2242, for a substantial new question (“SNQ”) of patentability to be present, it is only necessary that: (A) the prior art patents and/or printed publications raise a substantial question of patentability regarding at least one claim, i.e., the teaching of the (prior art) patents and printed publications is such that a reasonable examiner would consider the teaching to be important in deciding whether or not the claim is patentable; and (B) the same question of patentability as to the claim has not been decided by the Office in an earlier concluded examination or review of the patent, raised to or by the Office in a pending reexamination or supplemental examination of

the patent, or decided in a final holding of invalidity (after all appeals) by a federal court in a decision on the merits involving the claim.

In this case, Examiners find the basis of the SNQ is 'a HVAC system where: (1) temperature set points corresponding to building occupancy are set via the Internet; and (2) the memory storing historical values of the building temperature and the outdoor temperature is located remotely from the processors of the HVAC system' for the following reasons.

Examiners find the '382 Patent is directed to a system and method for using a wireless device as sensor for an energy management system (see title).

Examiners find the '382 Patent specification describes the prior art as including programmable thermostats with restrictive user interfaces that allows the thermostat to drift in a temperature range dependent upon a relationship between the inside and outside temperatures (see background of the invention; col.1:40-42 and col.2:1-25).

Examiners find the '382 Patent specification describes the prior art as including managing HVAC systems as function of occupancy via the use of keycard controls and/or motion sensor controls (see col.5:35-59).

Examiners find the independent claims of the '382 Patent are directed to, *inter alia*,

- “a first data...includes a measurement of at least one characteristic of the building,”
- “a second data...received via the Internet,”
- “a first temperature set point...when the building is occupied,”
- “a second temperature set point...when the building is unoccupied,”
- “receive commands through the Internet by way of a remote interface on a mobile...to adjust the set points,”

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- ‘send user-specific data through the Internet...about the HVAC system,’
- ‘controlling the HVAC system based on the determination the building is occupied/unoccupied,’
- ‘a memory that is located remotely from the processors of the HVAC system,’
- “the memory is configured to store historical values of the first data and the second data.”

Examiners find the original claims of the ‘382 Patent were rejected over US2008/0281472 (“Podgorny”) and US2005/0270151 (“Winick”) in the prosecution of the ‘085 Application.

Examiners find the claims were put into allowance with amendments that recite that the one or more processors include a processor “located remotely from the memory and is not electrically connected to the memory” and that the memory “is configured to store historical values of the first data and the second data” (see the ‘085 Application, Claim Amendment and Remarks filed August 2, 2019).

Examiners find the ‘382 Patent describes the first data is the current temperature of the building and the second data is the outdoor temperature of the building (see ‘382 Patent claim 17).

Because (1) it was known to one of ordinary skill in the art to control HVAC temperature set points as a function of occupancy where occupancy is determined via the use of keycard or a motion sensor and (2) the ‘382 Patent claims were placed in condition for allowance by adding limitations pertaining to the location of the memory (i.e., the memory that stores the historical building and outside temperatures) with respect to the location of the processors of the HVAC system, Examiners find these teachings important in determining the patentability of the ‘382 Patent claims.

Thus, Examiners find a reasonable Examiner would find a prior art teaching of ‘a HVAC system where: (1) temperature set points corresponding to building occupancy are set via the Internet and (2) the memory storing historical values of the building temperature and the outdoor temperature is located remotely from the processors of the HVAC system’ to be important in deciding whether the claims of the ‘382 Patent are patentable.

Order for Ex Parte Reexamination

10. A SNQ over Rhee, alone or in combination, has been proposed as to claims 1-20 (see Request, pg. 8).

Examiners find Rhee was filed on June 10, 2008, which is before the earliest possible effective filing date of the ‘382 Patent, which is July 14, 2008.

Examiners find Rhee was not previously considered because the art considered in the ‘085 Application was Podgorny and Winick.

Examiners find Rhee discloses an HVAC system with different temperature set points for when the building is occupied/unoccupied (see e.g., Table 1).

Examiners find Rhee discloses an energy management system (fig. 1A, #50) that includes the Internet (#52) and a wireless gateway (#53) and wireless controller (fig. 1B, #110) for managing the HVAC system as function of energy data comprising the building temperature, outside temperature (see ¶[0040]), and historical energy data (see ¶[0057]).

Examiners find Rhee discloses using a cellular phone network connected to a wireless controller (fig. 1B, #110) to manage energy devices (see ¶[0047]).

Because Rhee discloses using the Internet to manage temperature set points of an HVAC system as a function of building occupancy and historical energy data (e.g., building and outside temperatures), a reasonable Examiner would consider the disclosures of Rhee, alone or in combination with either Sullivan or Kate, to be important in deciding whether or not the '382 Patent claims are patentable irrespective of Rhee's specific disclosure of where the memory storing the historical temperature values is located.

Thus, Rhee is a prior art teaching that meets the basis of the SNQ, which is 'a HVAC system where: (1) temperature set points corresponding to building occupancy are set via the Internet and (2) the memory storing historical values of the building temperature and the outdoor temperature is located remotely from the processors of the HVAC system.'

Order

11. For the above reasons, the request for *Ex Parte* Reexamination of claims 1-20 over Rhee, alone or in combination with another prior art reference of record, is GRANTED.

Conclusion

12. A shortened statutory period for response to this action is set to expire 2 months from the mailing date of this action.

Extensions of time under 37 CFR 1.136(a) do not apply in reexamination proceedings. The provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Further, in 35 U.S.C. 305 and in 37 CFR

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1.550(a), it is required that reexamination proceedings "will be conducted with special dispatch within the Office."

Extensions of time in reexamination proceedings are provided for in 37 CFR 1.550(c). A request for extension of time must specify the requested period of extension and it must be accompanied by the petition fee set forth in 37 CFR 1.17(g). Any request for an extension in a third party requested ex parte reexamination must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request will not effect any extension of time. A request for an extension of time in a third party requested ex parte reexamination will be granted only for sufficient cause, and for a reasonable time specified. Any request for extension in a patent owner requested ex parte reexamination (including reexamination ordered under 35 U.S.C. 257) for up to two months from the time period set in the Office action must be filed no later than two months from the expiration of the time period set in the Office action. A request for an extension in a patent owner requested ex parte reexamination for more than two months from the time period set in the Office action must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request for an extension for more than two months will not effect the extension. The time for taking action in a patent owner requested ex parte reexamination will not be extended for more than two months from the time period set in the Office action in the absence of sufficient cause or for more than a reasonable time.

The filing of a timely first response to this final rejection will be construed as including a request to extend the shortened statutory period for an additional two

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months. In no event, however, will the statutory period for response expire later than SIX MONTHS from the mailing date of the final action. See MPEP § 2265.

13. Correspondence

All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:

By U.S. Postal Service Mail to:

Mail Stop *Ex Parte* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to:

(571) 273-9900
Central Reexamination Unit

By hand to:

Customer Service Window
Randolph Building
401 Dulany St.

Signed:

/DEANDRA M HUGHES/
Reexamination Specialist, Art Unit 3992

Conferees:

/CHARLES R CRAVER/
Primary Examiner, Art Unit 3992
/M.F/
Supervisory Patent Examiner, Art Unit 3992

Notice of References CitedApplication/Control No.
90/014,679Applicant(s)/Patent Under
Reexamination
10534382Examiner
DEANDRA M HUGHESArt Unit
3992

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20200333810-A1	10-2020	Steinberg; John Douglas	F24F11/70	1/1
*	B	US-10289131-B2	05-2019	Steinberg; John Douglas	G05D23/00	1/1
*	C	US-9244470-B2	01-2016	Steinberg; John Douglas	G05D23/00	1/1
*	D	US-8180492-B2	05-2012	Steinberg; John Douglas	F24F11/70	700/276
*	E	US-20090302994-A1	12-2009	Rhee; Sokwoo	H02J13/00017	340/3.1
*	F	US-8020777-B2	09-2011	Kates; Lawrence	F24D19/1084	236/1B
*	G	US-8239922-B2	08-2012	Sullivan; Daniel J.	F24F11/30	726/4
*	H	US-8738327-B2	05-2014	Steinberg; John Douglas	G01K3/08	702/182
*	I	US-8412488-B2	04-2013	Steinberg; John Douglas	G01M99/005	702/182
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.